



BETTER FRUIT

VOLUME XI

JULY, 1916

NUMBER 1



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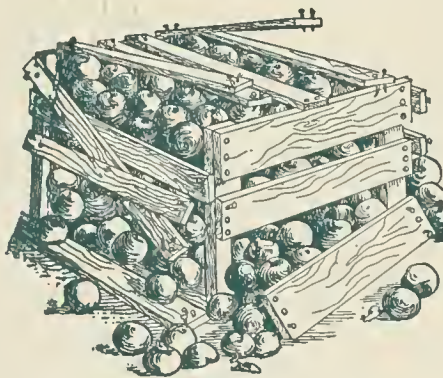
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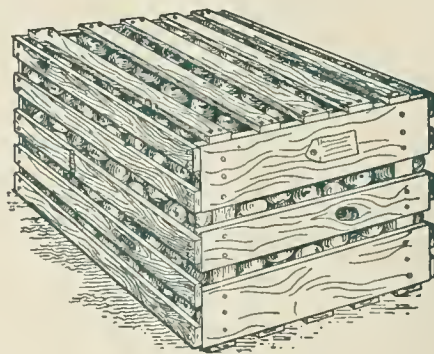
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

By-Laws of the Fruit Growers' Agency, Incorporated

Article I.—Name

Sec. 1. The name of this corporation shall be The Fruit Growers' Agency, Incorporated.

Article II.—Objects

This exchange is organized for the purpose of supervising the performance of a uniform contract which exists between the growers and their respective sales agencies, for the selling of the fruit products of the Pacific Northwest; to provide the means and facilities for carrying out the provisions contained in this contract as hereinafter set forth; to establish and maintain an "exchange" for the promotion of business and social relations among its members, and especially the advancement of the mutual interests of the fruitgrowers and fruit shippers of the Pacific Northwest, by all proper and legitimate methods; to collect and disseminate information; to secure improvements in transportation and storage services and conditions; to encourage competition by honorable methods only; to adjust by fair and equitable means grievances and differences; to correct trade evils and abuses; to prohibit all customs not in accordance with sound business principles; to secure the unification of contracts and accounting methods; to secure uniform methods in the physical handling, grading and packing of fruit from tree to car; to provide the necessary facilities for the extension and development of domestic and Canadian markets; to provide the necessary facilities for the promotion and conduct of export shipments and sales and work through joint agents and consignees for this purpose; to underwrite steamship charters and develop new fruit trade routes; to co-operate with federal agencies in such lines of work as they may undertake in behalf of the fruit industry; and to form and carry out plans for the mutual protection and benefit of its members in the harvesting, marketing and distribution of the Pacific Northwest fruit and produce crops.

To enable this corporation to carry out the purposes for which it is organized, it shall have the power:

1. To do all things necessary, proper and legal to carry out the purposes to its organization as above stated.

2. To buy, rent, lease, acquire and own such property, real or personal, as may be necessary for carrying on the business of the corporation and to sell, lease, mortgage, release and handle the same.

3. To aid in any manner any corporation or association organized for like purpose as this one, and to do any acts

and things necessary for the success thereof and to assist it in carrying out the purpose of its organization. To co-operate with and become a member of any state, interstate or national organization organized for the same general purpose as this.

4. To borrow money and secure the payment of the same by bond, mortgage, note, hypothecation or pledge of any property belonging to the corporation and to issue such promissory notes, bonds, debentures or other evidences of indebtedness as may be deemed necessary by the Board of Trustees, to meet and discharge its obligations, to advance and promote the lawful purpose of its creation.

5. To make and enter into contracts with its members, other persons, associations or corporations and to do any and all others acts and things necessary to carry out the purpose of its organization and which may be authorized by law, and to assist its members in every way practicable in the conduct of their business.

6. To sue and be sued.

Article III.—Membership and Dues

Sec. 1. (a) The membership of this corporation shall be composed exclusively of individuals, firms or corporations which are (1) growers, (2) growers' organization and (3) growers' selling agents who handle an average of one hundred or more cars of fruit and produce per year, and who are actually domiciled and do business in the States of Washington, Oregon, Idaho or Montana.

(b) There shall be two classes of membership, to-wit: (1) An active membership which carries with it the right to vote and hold office; (2) a qualified or passive membership which does not have the right to vote or to hold office.

(c) The annual fee for active membership shall be \$100.00, payable in advance. The annual fee for passive membership shall be \$5.00, payable in advance.

(d) Eligibility for membership: (1) Any growers' resident sales agent who is engaged in the actual sale and distribution of an average of not less than 100 cars of fruit or fruit and produce per year may become an active member only; (2) any grower whose average production is not less than one car per year and any growers' organization which handles an average of not less than one hundred cars of fruit or produce per year may become an active member. Any grower regardless of the amount of his annual production may become a qualified or passive member.

(e) Every applicant for membership, active or passive, shall agree and obligate himself to enter into and perform the uniform selling contract adopted by the corporation and to conduct his business in compliance with the by-laws and such rules and regulations as the corporation may from time to time make and promulgate.

(f) Such person, firm or corporation desiring to become an active or passive member of this corporation shall make application to the chairman of the membership committee in writing, accompanied by the membership fee and a general statement covering the applicant's financial responsibility, the length of time engaged in business, the character of his or its business, and references as to the business standing of the applicant. Such application and statement shall be presented to the membership committee as hereinafter provided.

(g) Members failing to pay their dues and assessments may be suspended or dropped from the roll at the discretion of the Board of Trustees, and shall thereupon forfeit the rights and privileges of membership in the corporation, but no member shall be expelled except by a two-thirds vote of the trustees, and no such expulsion shall act to relieve the member so expelled from liability for unpaid dues and assessments.

(h) The resignation of an active member shall not be accepted except upon four weeks' notice to the Executive Secretary in writing, and the payment of all dues and other obligations to the corporation, including those of the fiscal year, April 1 to March 31 (inclusive).

(i) After an active member has once been elected the fact that he shall in any one year fail to ship the requisite number of cars shall not ipso facto terminate his membership. However, if in two successive years he shall have failed to ship the requisite average number of cars per year, he may be dropped from membership upon the affirmative vote of two-thirds of the Board of Trustees.

(j) Any member guilty of conduct or business dealing prejudicial to the good name, standing or best interests of this organization, or who wilfully fails or refuses to perform any contractual obligation incident to membership, may be deemed unworthy of membership and expelled herefrom by a two-thirds vote of the active members of the Board of Trustees of this corporation; provided, however, that the accused shall first be given a fair and impartial hearing before the Board of Trustees.

(k) Expulsion shall deprive the expelled member from all his right, title and interest in and to all the property owned by the corporation, including its franchise.

Article IV.—Board of Trustees.

Sec. 1. The Board of Trustees of this corporation shall consist of not less than eleven voting members, five of whom shall be exclusively growers and five of whom shall be exclusively sales agents. The eleventh member of said board shall be elected from the active membership, and may be either a grower or a sales agent. Whenever it appears that the active voting member is a partnership, an association or corporation, the said partnership, association or corporation shall, if a partnership, select a member, if an association or a corporation, an officer and shall certify his name, and upon such certification the same member or officer shall be deemed eligible for the election to membership on the Board of Trustees.

Sec. 2. The Board of Trustees shall exercise the general powers of the corporation, and manage and control the affairs thereof. They may make rules not inconsistent with the laws of the United States, the state, or with the charter and by-laws of the corporation, for the guidance of the officers, and the management of its business. Demand from any officer of any of the books, papers, documents or records pertaining to the business of the corporation for examination or other purpose, may be made by the Board of Trustees at any time.

Sec. 3. Within thirty days after incorporation is perfected, at a meeting called for that purpose, the active members shall elect from its eligible membership eleven persons who shall compose the Board of Trustees.

Sec. 4. The term of office of the Board of Trustees shall be for the period of one year from the date of the annual meeting at which they are elected; or in the event of the omission or postponement of the annual meeting, until their successors are elected and have duly qualified.

Sec. 5. Should a vacancy occur on the Board of Trustees, the remaining members thereof, as soon as practicable thereafter, shall elect his successor to fill the unexpired term, said successor to be from the same geographical district in which the vacancy occurs.

Article V.—Officers

Sec. 1. The officers of the corporation shall be a President, Vice-President, Treasurer and Executive Secretary. The President must be a member of the Board of Trustees. The Executive Secretary shall not be a member of this corporation or of the Board of Trustees, nor shall he be affiliated with any individual, firm or corporation engaged in the marketing of fruit and produce. The President, Vice-President or Executive Secretary may also hold the office of treasurer.

Sec. 2. The trustees above named shall be elected by the active members at their annual meeting and shall hold office for a period of one year or until

their successors are elected and qualified. The officers above named shall be elected by the trustees from among their number at their annual meeting and shall hold office for a period of one year, or until their successors are qualified.

Sec. 3. Any officer may be suspended from office for neglect of or refusal to perform his duties, or for official misconduct, by a three-fourths vote of the Board of Trustees present at a regular meeting, or at a special meeting called for that purpose, provided that due notice thereof, with opportunity for hearing, shall have been given in writing to the delinquent at least twenty (20) days prior to said meeting.

Sec. 4. Officers, the Executive Committee, and the Board of Trustees shall be paid for the actual expenses incurred while attending meetings. If any officer or trustee render any special service for the corporation at the request or under the employment of the board, he shall be paid therefor such compensation as shall be determined by the Board of Trustees, and be reimbursed for necessary expenses incurred by him while engaged in such service.

Sec. 5. Any vacancy caused by the death, resignation or disqualification of any officer shall be filled by the Board of Trustees. In case of the temporary absence or disability of any officer, the board may appoint one of its members to act in his stead until his return or the disability is removed.

Article VI.—Duties of Officers

Sec. 1. The President shall preside at all meetings of the members and of the Board of Trustees. As the executive head of the corporation, he shall enforce its by-laws and execute the will of the members and of the Board of Trustees, and shall have general supervision and direction of the work of each officer and committee. He shall appoint, under the direction and subject to the approval of the Board of Trustees, all committees not otherwise provided for. He shall sign all instruments necessary to be executed under the seal of the corporation, and countersign all orders drawn upon the Treasurer.

Sec. 2. The Vice-President shall, in the absence or disability of the President, or upon his request perform the President's duties.

Sec. 3. The Treasurer shall receive and account for all money which shall

come into the possession of the corporation and disburse the same upon warrant of the Executive Secretary, countersigned by the President. The Treasurer shall furnish bond in such sum as may be required by the Board of Trustees, the expense of same to be paid by the corporation.

Sec. 4. The duties of the Executive Secretary shall be as follows: He shall keep full and accurate records of the transactions of the corporation, the Board of Trustees and its committees, conduct all correspondence relating to his department and issue warrants when countersigned by the President upon the Treasurer for such expenditures as are necessary in conducting the business of the corporation. He shall manage the affairs of the corporation and carry out the policies and instructions of the Board of Trustees. Subject to the approval of trustees, he shall have power to employ and dismiss all specialists, experts and agents, the services of whom may be required in conducting the affairs of the corporation. He also shall have power to employ and dismiss all necessary clerical and miscellaneous help. He shall be the custodian of the books, papers and records of the corporation and shall have power to make, under direction of and assuming that the Executive Secretary is the Treasurer, subject to the approval of the President and the Board of Trustees, any and all contracts for and in the name of the corporation. He shall give a satisfactory bond for the faithful performance of his duties, the amount of which bond shall be determined by the Board of Trustees and the expense of same paid by the corporation.

Continued in next issue

The New York Produce men will spend \$5000 to entertain the International Apple Shippers' Association members in New York City in August. Among the fruit dealers who are taking an important part in arranging the program are Messrs. E. N. Loomis, Joseph H. Steinhardt, W. H. French, C. W. Kimball, George W. Nix, P. F. Love and J. A. Melon. If any apple grower in the Northwest can spare enough money to pay his railroad fare to New York City, meals and entertainment will be plentiful. By the way, these meetings are the most business-like and the most instructive of any meeting conducted by any association in reference to the fruit industry.

Fruit Sizing Machines

The new "Francis Type" machine has solved the fruit sizing problem to a finer point of perfection than ever before.

It does very accurate work in sizing apples, peaches, pears, potatoes and tomatoes.

It has a great capacity and will not bruise. We are proud of this new development and you will quickly understand why when you have read our literature.

Send for illustrations and description at once.

Western Fruit Grader and Mfg. Co., Grand Junction, Colorado

The Tractor a Requirement for the Orchard

By C. M. Walker, Stockton, California

THE importance of cultivation in orchards cannot be emphasized too strongly, especially in those sections where it is essential that the moisture put into the soil by the winter rains should be conserved. Cultivating the soil destroys the weeds, which have millions of tiny tubes sucking up the moisture for their own use, and depriving the trees of it. It also preserves the soil mulch, a blanket of dust that covers the ends of the tiny capillary tubes formed in the soil, and prevents the moisture from rising through these tubes and evaporating into the open air. In many cases, orchard cultivation is neglected. In many others, it is unsatisfactorily or insufficiently done, owing to lack of proper tools or, more likely, lack of adequate power. The coming of the tractor has opened the way to the orchardist for frequent and thorough cultivation with a minimum expenditure of time and labor and, which is probably most important, a minimum of expense.

There are tractors on the market that are admirably adapted for orchard cultivation—narrow, low-down and short-turning—and these three are prime requisites of a tractor for orchard work. The tractor must be narrow enough to work between the most closely-set trees without danger of damage to the bark. It must be low enough to get under the low-hanging branches, and in this connection it is interesting to note that some of the tractors now offered for orchard work stand less than half as high as a horse. As for short turning, it is almost needless to say that to be successful in orchard work a tractor must be able to circle short, swinging from one row into the next without any difficult maneuvering or loss of time.

Granted that the orchardist uses care in his choice of a tractor, picking one that possesses the above qualifications and that is reliable and low in operating and upkeep costs, its possibilities are great. This, for example, is the experience of the Fargo Orchards Company of Portland, Oregon: "Our tractor has simplified our work at the orchard immensely. We find our average cost for plowing is seventy-seven cents per acre; for discing and spring-toothing, and for spiking and clod mashing sixty cents per acre. This is a big reduction over the horses, and saves us the trouble of handling a large number of men. Its main advantage has been its ability to do our work when we wanted it done, and the way we wanted it done. When the working season is over, the machine goes into its shed and we have no bother, trouble or expense until we take it out again in the spring. It has been a great pleasure to watch it working back and forth across the land during these hot days without a pause, while all about us our neighbors have been resting and blowing their horses at the end of every furrow."

This is just one typical example. Scores of similar ones can be found. Nor should the orchardist get the notion that the tractor's usefulness is limited to the work of cultivating. It is ideal for hauling fruit to market or bringing supplies to the ranch. Where teams tire and falter under the heat and long hours, the tractor goes on as long as the tractioneer is willing to work. And if he wishes, the tractor owner can find many opportunities for doing custom work in most communities—plowing, hauling, road grading, etc.—work that pays a good profit and keeps the tractor busy more days in the year.

A few years ago, the tractor was more or less of a mystery to many people. Today, thanks largely to the popularity

of the automobile, the gas engine is no longer considered a "fearful and wonderful thing." A man with as much intelligence as the orchardist would want the driver of his horses to possess, can operate and care for a tractor. The tractor manufacturers as a general rule provide complete instructions for the care and operation of the machines they build; also, in most cases, they provide an expert operator to unload and start the machine and instruct the purchaser. A few manufacturers even go so far as to hold schools in which owners or prospective purchasers can learn to become expert tractioneers. Service—not only the service in a machine but the service behind it—has become an important feature of the tractor industry today, insuring the purchaser's satisfaction and success with his machine.

The Standardization of Fruit Products

By C. A. Tonneson, Tacoma, Editor Northwest Horticulturist and Dairyman

THE production of fruit, including its manufacture into the various finished forms, is known by the term industry. The distribution, disposition or sale is strictly a business proposition. Those engaged in the business of selling invariably require from those devoting their attention to industry that the articles delivered to sell shall be of some standard form. Failure in this particular is, perhaps, one of the greatest causes of loss and dissatisfaction known both to growers and merchants. Those handling the business part say that buyers in the markets are exacting and discriminating, and that competition is keen on account of the great variety of fruits received from various other avenues and districts. About the only way the man who devotes his attention to industry can fully realize the importance of standardization is to see his product or goods in such form as he chooses to deliver them from the selling standpoint. In concluding the United States Farmers' Bulletin on the Distribution of Fruits and Vegetables on Large Markets, Charles J. Brand, chief of that bureau, states that one of the most practical steps the shipper can take to better his condition is to familiarize himself with business practices and secure a better knowledge of the way his produce is handled on the markets.

Considerable progress is being made in the standardization of fruits and fruit products, and of the methods employed in the Northwest. The grower who gets the market viewpoint of a standard pack of apples or pears, which includes uniform size, good color, sound fruit in a neat package, figures far enough back to include good tillage, pruning to open heads in the Coast section, spraying for scab and brown rot, and if the cost of production cannot be kept low enough to afford some fair margin of profit when figured on the average market price, then it is evident some other form of a standard product for these fruits must be undertaken or the project aban-

doned, for to offer fruits when not measuring up to market requirements is both demoralizing and unprofitable.

Let us look at our commercial fruit industry in the coast section of Washington from the marketing standpoint. Speaking only of the apples offered in properly standardized form there are but few varieties grown which, during the past five years, have been sold at prices to return some fair measure of profit to the growers. Among them may be mentioned Yellow Transparent, Duchess, Gravensteins, Wealthy, King and to a limited extent the Spitzenberg, also Golden Glow and Rome Beauty, and for future commercial markets perhaps the most promising is the Gravenstein. What shall we do with our many other varieties? Why not look into the dried fruit markets? The price to growers today is from 10 to 11 cents for sliced, cored and evaporated apples. A leading apple grower in one of the fruit-growing states east figured a net profit of about 20 cents per bushel at that price. He first took advantage of a satisfactory fresh-fruit market, then dried the balance of his crop, drying separately also the peelings and cores, which was sold for stock feed. There is a prospective growing market for dried apples in Alaska, in South America, and to some extent in Europe. Let us watch these closely through the United States Department of Commerce and through our leading exporting merchants from this Coast. In the marketing of fall pears which will carry well, particularly the Anjous, the experiments so far are very promising. If we can establish a trade for three or four of these fall varieties then it will not be difficult to adhere to required standards of the markets.

It is through the bush fruits that Western Washington is making some satisfactory degree of progress commercially at the present time. The berries are all naturally superb and the methods of handling these in fresh form are well up to standard requirements of the markets in which they are

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PORTLAND. E. SHELLEY MORGAN, MANAGER. OREGON.

sold. To reach the more distant markets and to further develop all markets, however, we must do more canning, make more soda-fountain fruit juices, more jams, jellies, fruit butters, sherbets, raspberry cider, unfermented grape juice, blackberry cordial, loganberry juice, make use of the strawberry whenever its flavor is desired.

The national and the state pure-food laws have been of inestimable value to the fruitgrowers of this part of the state. The markets are developing with wonderful rapidity for the unfermented juices of the loganberry, red raspberry and the grape. To standardize these as to quality and size of package and sell through regular market channels at prices satisfactory both to producers and consumers is the problem. Can the loganberry, red raspberry, strawberry and grape growers press out sufficient number of gallons of juice per acre and put it in standard form with sufficient profit margin to cover cost

of sale and further advertising, then a tremendous industry is assured.

Italian prunes are now pitted and canned in about a ten-per-cent syrup and put out under an Oregon brand, a standard article said to be moving well in the market. A few years ago it was the custom to use a forty-per-cent syrup with prunes. A better article is now put up at less expense. The same principle applies to other fruits and to juices. The chemists and processors have discovered that the simple matter of sterilizing the containers the second time at from 24 to 36 hours after the first, that the bacteria developing ferments is under better control than if more sugar had been used and sterilized but once. The same principle applied to the different berry juices. These products can be condensed, boiled down if need be and a much less proportion of sugar used in preservation than was formerly considered necessary and was the general practice.

Here is opportunity for service. Let us have a committee appointed to get at every phase of the selling requirements for standardization, eliminate all unnecessary expenses, but adhere strictly to rules by which those representing the industry of production and those having charge of the business of selling can meet with some measure of satisfaction to them and to the ever-increasing consumer.

The Ozark strawberry crop is estimated at 2300 cars. One hundred cars from any district in the Northwest looks pretty big. Apparently the Ozark strawberry growers do not fear over-production, in strawberries at least.

Lieut. Bryan, U.S.N. stated before the Am.Soc.of Naval Engineers: "Oils made from the asphalt-base crudes have shown themselves to be much better adapted to motor cylinders, as far as their carbon-forming proclivities are concerned, than are paraffine-base Pennsylvania oils."

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Correcting Unsanitary Orchard Soils



Drawn from actual photo.—Note marked difference in growth between tree planted in blasted hole and tree planted in spade-dug hole.

Unsanitary soil conditions are serious handicaps to the growth of orchard trees.

They are the direct cause of certain root diseases.

They limit the amount of plant food that is available, and cause mal-nutrition.

Root diseases and lack of food stunt the growth of trees and reduce the amount of fruit produced.

Slow growth, mishapen branches, small leaves and pale color of leaves are some of the signs of bad soil sanitation. When these are noticed, the faulty conditions should be corrected at once.

The trouble may be caused by shallow soil, hardpan, tight clay, or bad drainage. Rational blasting gets directly at the seat of trouble and relieves some of the most pronounced cases by shattering the hardpan and deepening the soil, the hard soil through which the stagnant surface

or by opening seepage channels into the subsoil.

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Orchard blasting is fully described in "Developing Logged-Off Lands." Land owners and orchardists can obtain a copy of this valuable book by addressing

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Economical Use of Irrigation Water

[Office of Information, U. S. Department of Agriculture]

UNDER conditions such as prevail in Idaho on a normal project with medium clay loam, irrigated land should be supplied with sufficient water during the season to enable each irrigated acre to retain two feet, according to a recent investigation of the United States Department of Agriculture. This applies, it is said, to at least 75 per cent of the irrigation projects in Idaho and probably to as large a per cent of the projects in other states. In order that the land may retain the needed 2 feet of water per acre, the former should receive about 2¼ feet on medium clay and sandy loam soils. Where the soil is porous or has a porous subsoil lying closer to the surface than 6 feet, more than this quantity of water should be delivered to the consumer, the exact quantity depending, of course, upon the porosity of the soil. Where an Idaho project is devoted one-half to grain and the other half to alfalfa or other crops, the total volume of water should be distributed something as follows: 18.7 per cent during May, 28 per cent during June, 32.8 per cent during July, 17.2 per cent during August and 2 per cent during the first half of September.

After this time the only demand for water is for live stock and domestic purposes.

These conclusions, which are based upon co-operative experiments conducted by the United States Department of Agriculture and the State Land Board of Idaho, are reported in a new Professional Paper, No. 339, of the United States Department of Agriculture, entitled "Experiments on the Economic Use of Irrigation Water in Idaho," by Don H. Bark. During the course of this investigation the water was measured upon 529 individual tracts covering a total area of slightly over 3,600 acres. The land was used for staple crops, alfalfa, clover pasture, spring and winter grains, potatoes and orchards.

Experiments show that the yield of grain on the heavier soils such as clay, clay loam, sandy loam and fine sand, will normally increase with the supply of water until an amount varying between 1.4 and 1.8-acre feet has been applied. After this the application of more water will decrease the yield of grain and in many cases the yield of straw as well. Alfalfa requires larger

quantities of water and the experiments did not reach a point at which an increased supply began to lessen the yield. If the yield alone is considered it is difficult, it is said, to apply too much water to alfalfa, provided no more is applied at one time than the soil will promptly absorb. With both grain and alfalfa, however, the amount of water that it is profitable, from a business point of view, to use depends upon the relative cost of land and of water and other local economic conditions.

With potatoes, it is found that there is a strong tendency for the yield to increase with the supply of water. The rate of increase, however, grew smaller as the quantity of water was increased, and on clay-loam soils it probably will not be advisable to apply more than 2 or 2½ feet per acre to the crop.

The report also deals with the question of the proper quantity of water to apply at each irrigation. An unavoidable loss from evaporation invariably occurs during and immediately after irrigation and it is, therefore, desirable to have no more applications during the season than are required to maintain the needed moisture content in the soil. Investigators found that from 3 to 6 acre inches at one application is the correct quantity. Impervious soils should be so manipulated that they will absorb the smaller amount at least, while on the porous soils large irrigation heads should be used. On these porous soils very little can be accomplished with small heads of water because the water is absorbed so rapidly that it cannot be forced over the field. The average size of the irrigation head over the greater part of Idaho seldom exceeds 1 to 2 second feet. On the porous soils, the use of heads three or four times this size, it is said, will give a much higher efficiency.

In conclusion, the report points out that the determination of the proper supply of water for an irrigation project is a very serious problem. If too little water is allotted, the yields will be small and the lands never will reach their highest possible value. On the other hand, if too much is allotted, the excess supply is almost invariably used and the irrigated lands may deteriorate rapidly through waterlogging. Moreover, the water is diverted from use elsewhere and the ultimate area of irrigated land thus reduced. In determining the amount of water to be used, other factors than the maximum yield must also be taken into consideration. The cost of the land, the cost of the water, and the value of the crops produced are all important considerations. There are but few cases in which the increase in yield is proportionate to the quantity of water used.

The Hood River Apple Growers' Association, through their sales manager, Mr. Wilmer Sieg, reports the entire cherry crop of 1916 has been sold.

The North Carolina fruit crops were damaged by cold weather and frost during the month of April.



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Sweet Clover a Strong Nitrogen Gatherer

By F. B. Linfield, Bozeman, Montana

THERE are many varieties of sweet clover, but only two are common in our Northern country, the white (*Melilotus alba*) and the yellow (*Melilotus officinalis*). Both are biennial plants. The white variety is preferred as a crop. A study of the characteristics of this plant shows its wonderful adaptability to a great variety of conditions. It is a very vigorous and rapid grower, attaining a height of 5 to 10 feet. Extreme of heat or cold does not seem to affect the plant. It grows well in the extreme South and all the way between up to and including Montana, where it grows well in nearly every part of the state. It can withstand very great extremes of wet or dry soils and it will grow on stronger alkali soil than any other farm crop. In fact it has considerable renovating power when grown on such soils. It will also grow better on very poor soils than any other leguminous plant, but to do its best the soil should be rich in lime. A peculiarity of the plant is that it needs a very firm seed bed. It will even start on hard, compact soil if moisture is available. It does not germinate readily or grow well on loose, open soils. Sweet clover is a strong nitrogen gatherer, the roots being loaded with nodules even on poor soil. It is, thus, a great soil enricher. Some soils need inoculation, but this is not commonly the case in Montana.

As the plant is a biennial, it does not grow very high the first year, but stores up a large food supply in its fleshy roots. The second season it develops to its full height, and if permitted to do so matures a heavy crop of seed. At the end of the second season the plant dies; the roots, thus, adding much

humus to the soil. As a rule the seeds are slow to germinate, as there are many hard-coated seeds. Probably not more than half the seeds will germinate the first season. This means a little thicker seeding than for alfalfa, say, 12 to 15 pounds per acre. In the dryer sections of the state, on the bench lands, the crop may be seeded in rows, 24 to 36 inches apart, when 3 to 5 pounds of seed per acre will be plenty.

Sweet clover produces a very fine quality of honey, and as it flowers profusely and continuously through the season it provides a large quantity of honey for the honey bee.

Compared with alfalfa, sweet clover is a stronger grower and a much larger plant. It is richer also in protein, when cut in early bloom, which is the best time for making hay. It is not to be recommended as taking the place of alfalfa or red clover where these do well. Sweet clover is such a vigorous grower that to many farmers it appears to be a weed. However, it seems to grow mainly in waste places only, and does not usually trouble the cultivated fields. It is not readily eaten by stock because of its bitter taste, and they have to be starved to it at times. Once they learn to eat it, however, they seem to relish it as well as they do alfalfa. It is valuable as a fodder crop only in its early stages of growth, as after it is in full bloom it gets very woody and the leaves fall.

The crop should be seeded in spring on a firm seed bed. Fall-plowed land, or land that has had a cultivated crop the year before, is to be preferred. Spring-plowed land should be very firmly packed before seeding to sweet clover.

Probably the greatest value of sweet clover is as pasture. It should have a good start in the spring and then enough stock kept on the field to prevent it from gaining on them. If it should get ahead of the stock the crop should be mowed down. The plant is an early grower in the spring, so that it will make one of the earliest pastures. Another advantage is that it very seldom or never bloats stock, whereas there is always more or less danger with alfalfa. All classes of livestock do well on sweet clover pasture, but hogs especially so. When used for hay, cut the crop when the first few blooms appear. It should be cut about four inches above the ground, as unlike alfalfa, the second crop grows from low branches and not from the crown. Thus, if the crop is cut so close to the ground as to remove the branches the next crop is very much reduced. In the moister parts of Montana the first crop may be cut for hay and the second left for seed. At the present time there is good money in the seed crop. As sweet clover is a biennial plant, provision should be made that it reseeds itself. If pastured or cut too close no seed will be formed, so the plant will disappear after the second year.

The characteristics of the sweet clover as given above shows its adaptability for the orchard. Its deep tap root, which dies at the end of the second year, adds nitrogen and humus to the soil and also opens up the soil to the action of the air. As the plant is a vigorous grower and accumulates a large store of nitrogen it makes a good green manure for plowing under. Unlike alfalfa, it is a plant comparatively easy to get rid of by summer cultivation. It is a short rotation, nitrogen-gathering plant.

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Picking and Packing of Cherries and Prunes

The importance of careful picking and handling in preventing decay in such fruits as cherries and prunes is brought out in Department Bulletin 331, which contains a report of experiments conducted with these fruits in the Willamette Valley, Oregon. Hitherto it has not usually been found profitable to ship fresh cherries and prunes from this region to distant markets because of the unsatisfactory condition in which the products arrive. These investigations demonstrate that a great part of the decay can be prevented by the exercise of proper care, but that unless care is exercised there is little hope of disposing of the fresh cherry and prune crop of this region in distant markets. The facts brought out in the investigation are believed to be applicable also to other sections of the country.

The losses which shippers of cherries and prunes experience are due chiefly to brown rot and to other fungi which gain entrance through abrasions in the skin, or other injuries to the fruit. The brown rot must be controlled by proper orchard practice. On the other hand, the loss from those forms of fungi which do not attack healthy, sound fruit can be minimized by careful handling.

In order to demonstrate this fact the investigators stored various lots of carefully handled fruit and of commercially handled fruit for varying periods in a refrigerator car, in which the conditions were made as nearly as possible identical with those under which the fruit would travel in actual commercial practice. At the end of five days, in the iced car, the carefully handled fruit showed an average of only 0.5 per cent decay, while the commercially

handled fruit showed 2.8 per cent of decay, or practically six times the amount. At the end of ten days the carefully handled fruit had 1.5 per cent of decay and the commercially handled lots 12.3 per cent, or eight times as much. Ten days is approximately the time required to ship fruit from the Willamette Valley to Chicago.

Similar results were obtained from experiments with prunes, although with them the percentage of decay for both commercially handled and carefully handled fruit was smaller than with cherries. It is pointed out, however, that although every effort was made to have the conditions approximate those in actual transportation, it is probable that the fruit kept better in the iced car used for these tests than it would in the ordinary refrigerator car in transit.

Experiments were also conducted both with carefully handled and commercially handled fruit to determine the value of precooling before placing the fruit in the refrigerator car. These tests show that precooling is undoubtedly of value. On the other hand, it cannot be relied upon to prevent losses due to careless handling. Injured fruit will decay whether it is precooled or not, and for this reason precooling is not recommended unless it is preceded by adequate care in picking and packing.

It is also pointed out that any delay between the picking and the shipping of fruit hastens decay. The amount of damage done in this way will vary, of course, with the weather conditions, but under any circumstances it is considerable.

In view of these facts, it is recommended that every precaution should be taken in picking the fruit not to bruise it, and that it should be transferred as few times as possible from one container into another. While it is being held in the orchard after picking it should be kept in the shade, and the hauling wagon should be provided with good springs and covered with canvas in order to keep off sun and dirt. In grading, all damaged fruit should be culled out, and as soon as the shipment has been packed it should be placed in the refrigerator car.

The extra expense of careful handling, it is said, will be more than offset by the reduction of losses from decay and the ability of the fruit to maintain itself in good condition while exposed



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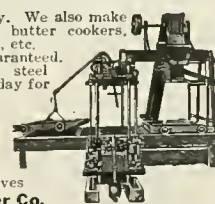
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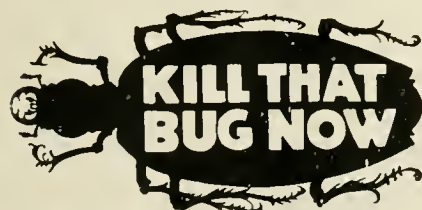
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for sale. If these suggestions are adopted generally by fruitgrowers and in consequence a larger proportion of the crop marketed fresh, it is believed that the industry will benefit greatly and its extension will be made profitable. That this fact is being recognized by fruitgrowers is indicated by the co-operation afforded the department in its investigation by the growers in the Willamette Valley.



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of Congress of March 3, 1879.

The Fruit Growers' Agency, Incorporated.—The Fruit Growers' Agency has made splendid progress, asserting it now controls about 75 per cent of the tonnage. Great credit is due the government officials, Messrs. Basett, Moormaw and Kerr, and to Captain Weyrauch, the president, who have worked unceasingly and untiringly. The Agency will render market service similar to the service rendered on strawberries and peaches, which has proved very beneficial to selling concerns. Therefore it is not entirely experimental, as many people imagine. However, the Agency will cover a much broader field, doing much more than rendering a service on market information. The Agency has been endorsed by the government, by our governors and Experiment Station men, bankers and business men very generally. The cost will not exceed one dollar per car, which will be about one-sixth of a cent per box. It does not seem that something that is so well recommended should be passed up when the cost is so small an item. The fruit industry needs the good will of everybody. It needs the good will of those who have endorsed the Fruit Growers' Agency. To refuse to join would incur the displeasure of those who have recommended the Agency. It does not seem that any grower can afford to do this when the cost will be so small. It is the general, almost the universal opinion, that the Fruit Growers' Agency will be a success. A year's time will show its value. The cost is small. It is the opinion of the officials, and those who have worked most in behalf of the Agency, that after a year's time nobody will want to get out, but that everybody will want to get in. With the endorsements given the Fruit Growers' Agency it seems that the fruitgrowers would act wisely in giving it the fullest support possible in order that

the Agency may have the fullest opportunity to accomplish the greatest amount of good. If this is done, those who have given the matter the most attention believe it will prove a success, and that the fruitgrowers will be helped and enabled to obtain better prices. That is what they all want.

Apple Estimates for the Northwest.—Early this spring fruitgrowers throughout the Northwest were all commenting upon the wonderful amount of spurs and fruit buds and prophesying a bumper crop. There was no question about it. The trees were full of spurs—the spurs were full of buds, great big ones, bigger than ever before. Then came blooming time. The orchards looked like snow banks. Every fruitgrower figured, if apples brought good prices, he would be a millionaire. This wonderful crop that was prophesied in the bloom has been greatly diminished. Several fruit sections in the Northwest suffered from frost damage all the way from 20 per cent, some estimating the loss as high as 100 per cent. In addition to the frost damage there was a shedding after blooming that was fierce. Nearly all trees shed not only many clusters, but the balance of clusters to one in a cluster. This was followed by a continuous dropping during the month of June. At the present time the apples are still small, about the size of marbles, and green, like the color of the leaves, scattering over the trees in varying quantities, with very few orchards heavy. So it is almost an impossible proposition for a grower to even estimate his own individual crop. The above condition is illustrated by the way one grower expressed himself. During the blooming time he estimated his crop at 15,000 boxes; after shedding he estimated his crop between 10,000 and 12,000 boxes; after the June drop between 8,000 and 9,000 boxes. While it is too early to make any definite

statement, there are many who do not figure the 1916 crop of Oregon, Washington, Idaho and Montana will exceed very much, if any, the crop of 1915. In all probability there will be more apples in 1916 than in 1915, but the bumper crop that we were going to have when the estimates were given out in blooming time has faded away. About August first pretty reliable information can be furnished as to the size of the crop, but not very much sooner.

Spraying for Fungus.—Never before in the past in the Northwest have the fruitgrowers sprayed more thoroughly for codling moth and fungus than they have this year. It is too early to tell anything about the damage from codling moth, but the results obtained in preventing scab was something phenomenal. The crop will be clean. The general plan of spraying for the prevention of scab was pretty well established by previous years' experience, consequently nearly all growers in districts troubled with scab used the proper fungicides at the right time, getting splendid results. However, there was much doubt about the advisability of using a fungicide with arsenate of lead in the second codling-moth spray, which is usually put on in June, for the reason at this time the weather is very warm and fungicides, particularly those containing sulphur, are apt to burn. Bordeaux is also apt to burn at this time of the year when the fuzz is still on the apple, especially if followed by rain. It remains to be determined whether it is advisable to apply a fungicide in this spray or omit it. This year when the weather turned warm a burning occurred from the sulphur fungicide. A great many orchardists who had kept their orchards free from scab by previous sprays omitted the fungicide. These had no burning. It remains to be seen whether scab will develop in these orchards later in the

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season. If it does, then in future years the grower will have to determine which is the greater loss, from scab or the loss from the burning. However, it is believed that if the grower has been successful in keeping his orchard free from scab by previous sprays that it may not be necessary to use a fungicide in the second codling-moth spray.

The Stephens Bill.—The Stephens Bill before Congress is a bill for price maintenance and to prevent price cutting. There is nothing that injures any business more than unnecessary and serious price cutting. It applies to the fruitgrower as well as any other kind of business. Those who have investigated the Stephens Bill fully believe it will be a big factor in stabilizing business and maintaining just prices. It has received strong endorsements; therefore it is believed that every man in business, including the fruitgrower, will be benefited by this bill, consequently it is entitled to support. Letters from Congressmen from the Northwest indicate they have investigated the bill and believe it a good one. Other Congressmen, who have not investigated the bill, say they will give it immediate consideration. So it is to be hoped that everybody will familiarize themselves with the Stephens Bill, and it is believed they will find it a desirable bill. If they do, it is everybody's duty to support it.

Strawberries in the Northwest.—For the first year in the strawberry business of the Northwest it may be said that the strawberry crop has been handled under more orderly control than ever before. As a result splendid prices are being received. Orderly control, intelligent distribution and elimination of self-competition are the necessary factors in obtaining market values for any kind of fruit. The strawberry situation has proved this in a very definite and positive sort of way, so that no one can question that other kinds of fruit will be equally benefited if marketed in the same orderly, intelligent way, and properly distributed.

Cherries.—A number of new canneries have been opened up in the Northwest during the last two or three years. In every district where there is a cannery Royal Ann cherries have brought good prices. A few years ago the grower considered himself lucky to get three or four cents a pound for cherries. Since the introduction of canneries markets for fresh cherries have not been glutted, the grower having the option of either shipping fresh or selling to the cannery, resulting in cherry growers being able usually to obtain about five cents per pound for Royal Anns.

The strawberry reports being rendered daily by the Office of Markets, Department of Agriculture, are being found very valuable and very helpful to all shipping organizations. Each report rendered contains valuable information to the shipper about the marketing conditions in each city; for

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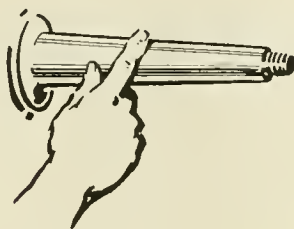
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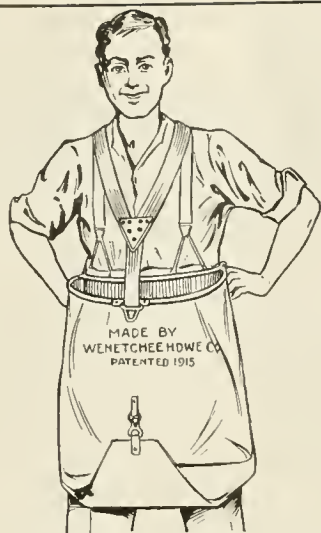
Portland, Oregon

Comparatively Speaking

The checking account is as important a factor in the systematic management of household affairs as it is in the well-organized business. Paying by check is the advantageous, polite way. It reflects one's ability to do things. Indicate your estimation of all this by paying by check. It will be to your convenience, satisfaction and profit. This strong bank, oldest in the Northwest, respectfully invites your checking and savings accounts.

instance, from the sheet of June 17th, the report is as follows: "Minneapolis, cold, cloudy. Iowa five cars, Illinois one car arrived, seven cars held over, demand moderate, quality fair, soft, best 24 quarts \$2.50 to \$3; 16 quarts \$1.50 to \$1.75." In the same report is included similar statements from the following cities: Boston, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Des Moines, Detroit, Indianapolis, Kansas City, Milwaukee, New York, Omaha,

Philadelphia, Pittsburg, St. Louis, Sioux City, Washington. It would be well worth while for every grower when he visits his shipping association to ask to see one of these reports. By looking it over the grower will get an idea of the valuable service the government is rendering on strawberries this year, which is similar to the service they will render on peaches during the peach-shipping season, and on apples during the apple-shipping season.



"Wenatchee" Fruit and Vegetable Picking Bags

(Patented April 27, 1915)

This bag is emptied by releasing a snap. The bag will hold about a bushel. When snapped at the frame it will hold about a half bushel. The frame is made of steel, the canvas is 10-oz. and every point is reinforced with leather where from experience it has been found necessary. **Price \$1.75 post paid** to all parts of the United States where we have no agents.

Wenatchee Hardware Company

Sole Manufacturers

Wenatchee, Wash.

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly.

SEND FOR BOOKLET

Arcadia Orchards Company

Deer Park, Washington



**RHODES DOUBLE CUT
PRUNING SHEAR**

Pat'd June 2, 1903.

RHODES MFG. CO.,

800 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only
pruner
made that cuts

from both sides of
the limb and does not
bruise the bark. Made in
all styles and sizes. We
pay Express charges
on all orders.

Write for
circular and
prices.

Paint Large Pruning Cuts

By J. B. Hundley, Yucaipa, California

IN nearly all of the old orchards we see many large trees which should be in their prime, but unfortunately nearly dead. If the pruning cuts of years ago had been properly cared for many of these trees would now be yielding large crops. A closer exami-

nation will show the hearts of the large limbs and even the trunks decaying. This is caused by a rot fungi which enters through large cuts left unprotected from the weather.

Every book on the culture of the apple, pear or other deciduous tree rec-

ommends the painting of all large wounds. The main difference among authorities is in the time of application and the material used. There are some very good men who recommend painting as soon as the cut is made. It is because many have followed this and have seen the effects that we hear so much talk of the evils of painting, and see examples on every hand of trees with large unhealed cuts left unprotected. If the owners of these trees would visit some nearby old orchard and notice the number of limbs and trunks with the hearts rotting out, I believe more interest would be shown in protecting our orchards from such conditions.

If a cut is painted at once after pruning the sap will be held on the surface and will sour, often running from the wound and killing the bark for inches down. Of course this is worse than if the wound had not been painted. However, if the cut had been left exposed to the air for a few months the wood would have become hardened by exposure and could safely have been painted without danger of the above mentioned undesirable result. This later painting will prevent any dry rot fungi from entering the limb. It seems most desirable to paint all cuts larger than a quarter in May or June, as by this time the wood is hard and as yet has not started to decay.

In painting pruned cuts it is not best to use a material that will become hard and chip off with the growth of the tree; for this reason never use white lead or paint. They are too temporary. Grafting wax is probably the best material to use. Roofing compound, asphaltum or even paraffine may be used quite successfully. In painting do not apply the wax or other material too thickly. All that is necessary is a thin film to keep the air from the wood. If it is put on too thick very often in the heat of summer it will run, injuring the bark.

The following is an excellent formula for grafting wax: Resin, 6 pounds; beeswax, 1 pound; linseed oil, 1 pint. Melt together and apply at a temperature of 180 degrees.

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Send me your name and address right NOW and I will send you **INVESTING FOR PROFIT** magazine absolutely free for six months. It tells how to get the utmost earnings from your money—how to tell good investments—how to pick the most profitable of sound investments. It reveals how capitalists make \$1,000 grow to \$22,000—in fact gives you the vital investing information that should enable you to make your money grow proportionately. I have decided this month to give 500 six-months subscriptions to **INVESTING FOR PROFIT** free. Every copy is **WORTH AT LEAST \$10.00**

to every investor—perhaps a fortune. Send your name and address now, mention this paper and get a free introductory subscription. Conditions may prevent repeating this offer. Better take it now. You'll be willing to pay 10c a copy after you have read it six months. H. L. Barber, Pub., 533-30 W. Jackson Blvd., Chicago

HOME CANNERS

Our PATENTED EL FLO outfits are the ORIGINAL instantaneous sterilizers. Different from the wash boilers generally sold for canners at higher prices. We are PATENTees of the only SELF HEATING CAN SEALING DEVICE on the market. With our combination, children are successful and pile up bank accounts and cut the family living expense. Everything for canning. Catalog free. Address nearest office. **Home Canner Mfg. Co.** Alexandria, Minn.

Oregon's Dairy Products Worth \$18,000,000

There are no dull periods in the dairy business. The weekly cream check insures regular profits the year around.

Dairying is one of the best side lines for a fruit-grower. The right start is a few good cows and an

INDIANA SILO



Silage furnishes the most economical and succulent feed for dairy cattle. And the most economical silo is the "Indiana."

FREE

Our new Silo Book sent free to readers of "Better Fruit." A postal will do.

Built on the Pacific Coast by

The Chas. K. Spaulding Logging Co.

SALEM, OREGON, U. S. A.

Overheating Often Attributable Faulty Ignition

A pamphlet just issued by the Standard Oil Company, entitled "Engine Overheating, Mechanical Bulletin No. 3," throws considerable light on the problem of overheating of automobile motors. This bulletin says in part:

"One of the common causes of overheating is due to ignition. A late spark overheats the motor; the charge is ignited after the piston has started downward on the power stroke; consequently the hot gases are not expelled from the cylinder before the second charge is fired. This will continue until the cylinders become so hot that pre-ignition will take place. That is, the gas will ignite before the piston has reached the correct point, resulting in what is known as a 'spark knock.' By advancing the spark lever on the quadrant, the mixture is ignited before the piston has reached top center, so that when the piston does reach the center and starts down, the expansion of the gases is complete, and they are exhausted at a comparatively low temperature. Missing of one or more cylinders has a tendency to overheat the motor, as the fresh gas is taken into the missing cylinder and ignited by the outgoing charge from the working cylinder, which causes muller explosions and back pressure on the cylinder which are working. The right kind of lubricating oil is a great help in keeping the motor cool, and many of the leading automobile engineers and motor experts say that oil made from Western asphalt-base crude has less tendency to break down under cylinder heat than oil made from other crudes, and is, therefore, a more efficient aid in keeping the motor cool."

Exchange Secures Reduction in Rates for Delivering Hood River and Mosier Apples

Another six and seven cents per hundredweight has been clipped off the cost of delivering Hood River and Mosier apples to Arizona markets as a result of the efforts of the Traffic Department of the Northwestern Fruit Exchange. The rates from Hood River, Mosier and The Dalles to Bisbee and Douglas, Arizona, respectively, of \$1.15 and \$1.17 per hundredweight, have been reduced by the interested carriers, effective May 31, 1916, to \$1.09 per hundredweight from Hood River and \$1.10 per hundredweight from Mosier and The Dalles. Mr. Robinson, Traffic Manager of the Exchange, says: "We called the attention of the carriers to the fact that the published through rate, which necessarily was the lawful rate in use, was in excess of the sums of local rates and should be accordingly reduced. The carriers were quite willing to make the change and did so promptly. This means a saving of from three to three and a half cents per box, or from \$18.71 to \$21.83 per car to the growers in the districts mentioned, and will help to pay their advertising bills in developing new markets in Arizona and other states."

FOR STRAWBERRY RESULTS

You must use a fertilizer that has demonstrated that it makes good. Strawberry growers who have used

"Beaver Brand" Animal Fertilizer

know that our claims for this famous fertilizer are not based on theory but on facts.

One Grower Reports:

1st year, without fertilizer, 150 crates per acre.
2nd year, fertilizer applied, 175 crates per acre.
3rd year, fertilizer applied, 192 crates per acre.

Whether you have one acre or a hundred, you should *prepare now* for next year and apply to your ground before fall. You will have an *increased quality and quantity* crop.

"Beaver Brand" Animal Fertilizer

for Strawberries, as made by the Union Meat Company, contains the proper amount of nitrogen, phosphoric acid and potash to supply your soil with the necessary plant food.

Address Box 101 for free information folder and ask for the names of those who know what this famous fertilizer will do.

Our representative will be in Hood River in August. Dates will be announced in the Hood River newspapers. Arrange to meet him.

UNION MEAT COMPANY

North Portland, Oregon

The Paris Fair

HOOD RIVER'S LARGEST AND BEST STORE

RETAILERS OF
EVERYTHING TO WEAR

AGENTS FOR
HAMILTON & BROWN AND
THE BROWN SHOES
HART, SCHAFFNER & MARX
CLOTHES
MANHATTAN SHIRTS
JOHN B. STETSON HATS
NEMO CORSETS

Strictly Cash—One Price to All

Fruit Sizing Machines

Highest award at Panama Exposition, San Francisco.
Three years successful operation.

The 1916 Sizers and Sorters greatly improved. Prices much reduced

We make four kinds.
Write for catalog.

Price Fruit Sizer Co.
North Yakima, Wash.

MYERS POWER PUMPS
ARE USED ON THOUSANDS OF FARMS

Have you ever felt the need of better water facilities? If you have become tired pumping and carrying water or you need more water than your hand pump can supply, install a MYERS POWER PUMP and put your gasoline engine to work... Have a Power Water Plant that is self-contained, economical and satisfactory, and that will furnish plenty of water for every purpose... for your home and surrounding buildings, for watering stock, sprinkling lawns, fighting fires, etc.

YOUR GASOLINE ENGINE ANY STYLE WILL OPERATE A MYERS BULLDOZER POWER PUMP SATISFACTORILY

MYERS POWER PUMPS are built in many styles and sizes for deep and shallow wells—capacities from 300 to 7200 gallons per hour—operating by gasoline engine, motor or other power. Can be installed by an ordinary mechanic. They are simply constructed, easy to operate and cost of upkeep is low. For use wherever water is used in quantity. If interested in better water facilities, write today. Catalog and information free.

F. E. MYERS & BRO. 120 ORANGE ST. ASHLAND, OHIO.

Cleaner spark plugs

Your spark plugs will keep cleaner if you use a straight-distilled, refinery gasoline. A mixed or imperfectly refined gasoline breaks up and deposits carbon instead of exploding completely.

Red Crown

the Gasoline of Quality

is the all-refinery gasoline—not a mixture.

DEALERS EVERYWHERE AND AT OUR SERVICE STATIONS

STANDARD OIL COMPANY
(California)



Nitrate for the Orchardist

A few years ago some experiments were conducted by Professors Ballard and Volek at Walsenville, California, using nitrate on an orchard which had bloomed pretty regularly but failed to set fruit. The results were very gratifying. Since then nitrate has been tried by orchardists in various other districts by both applying the crystals to the ground and cultivating them in. Splendid yields have been obtained where checked trees set very little fruit, and also in addition to this the foliage has become healthy, vigorous and green. According to all experiments where nitrate has been used early in the spring, about March 1st in the Northwest, a much improved set of fruit has occurred. It is believed by a great many that nitrate applied in July, late summer and early fall, during the time the fruit buds are forming, will be very helpful in making vigorous fruit buds for the following year. The idea is new but the suggestion is worthy of a good, fair trial by orchardists who are not getting satisfactory yields.

The Fruit Industry Paragraped

The Dri-Fresh Evaporator Company of The Dalles, Oregon, turned out a fine product last year and expect to do a largely increased business during the year 1916.

The apricot crop of California will probably amount to 250 cars.

The shipment of Sacramento cherries began by express the third week in April.

Colorado estimates the Western Slope fruit crop at 3705 cars. In 1914 the crop was 4407 cars.

The peach crop in Georgia is estimated at about 3500 cars. Maryland and Connecticut report about half a crop.

The first car of California cherries arrived on the New York market May 5th, being sold by Connolly Auction Company.

One fruit dealer says the American growers are optimistic, almost fatalists. Anything like preparedness they think unnecessary.

The Canadian Pacific Railway for dining cars, hotels and steamship service purchased over \$10,000,000 worth of fruit from the Western Provinces.

The first straight car by express of California cherries, containing 2285 packages, was sold at Greenes Fruit and Auction Company, Chicago, by Mr. Charles Irregang for \$5400.

\$500,000 worth of apples were destroyed in the State of Washington in 1915 by the codling moth, according to a report by Mr. T. O. Morrison, in charge of the Department of Horticulture, Olympia.

Go East This Summer

via The Scenic Highway

Low Round Trip Fares

To Middle West and the Eastern States and Canada Daily



Two Thru Trains

Each Day

To Chicago

via Minneapolis and St. Paul

One to St. Louis

Low Park Fares

To and thru Yellowstone Park

June 15 to Sept. 15

To California

Have your ticket read via Portland and G. N. P. S. S. Co. new, fast, palatial steamships

ASK YOUR LOCAL AGENT, OR WRITE
A. D. CHARLTON, A. G. P. A., PORTLAND, OREGON

The Fruit Industry Paragraped

The White Salmon Valley Fruit Growers' Union and the Underwood Fruit Growers' Union have merged under the title of the White Salmon Valley Fruit Growers' Association, with Paul McKercher as president and Ira E. Hyde as manager.

It is stated that the Newberg Co-Operative Association has become the property of A. Rupert & Co. of Portland. The association comprises a membership of some 350 growers. This district grows prunes and berries extensively and other fruits in moderate proportion.

Kennewick, Washington, sold the first crate of strawberries for sixteen dollars. It is too bad that every crate of strawberries could not be the first crate. The variety grown extensively in Kennewick is the Clark Seedling. The prices have been very good during the shipping season.

Yakima Valley believes in uniformity of pack. The present interest indicates strongly that Yakima will put up a uniform, dependable pack this season, surpassing any past season's efforts.

The potato growers of Yakima Valley believe in organization and co-operation and hope to have a strong association.

SUPERINTENDENT

Soon open for engagement. Very large orchard or farm preferred. Years of experience; practical and technical. Shaping up new or run-down propositions a specialty. Address G. F. W., care "Better Fruit."

Wanted

Position as foreman or superintendent on a fruit or general farm by young married man; agricultural college graduate; experienced on both fruit and dairy farms. Strictly temperate; good references.

Address R. W. M.,
2219 H. Street Bellingham, Washington

FRUIT GROWERS Dehydrate Your By-Products

It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

For new descriptive booklet address

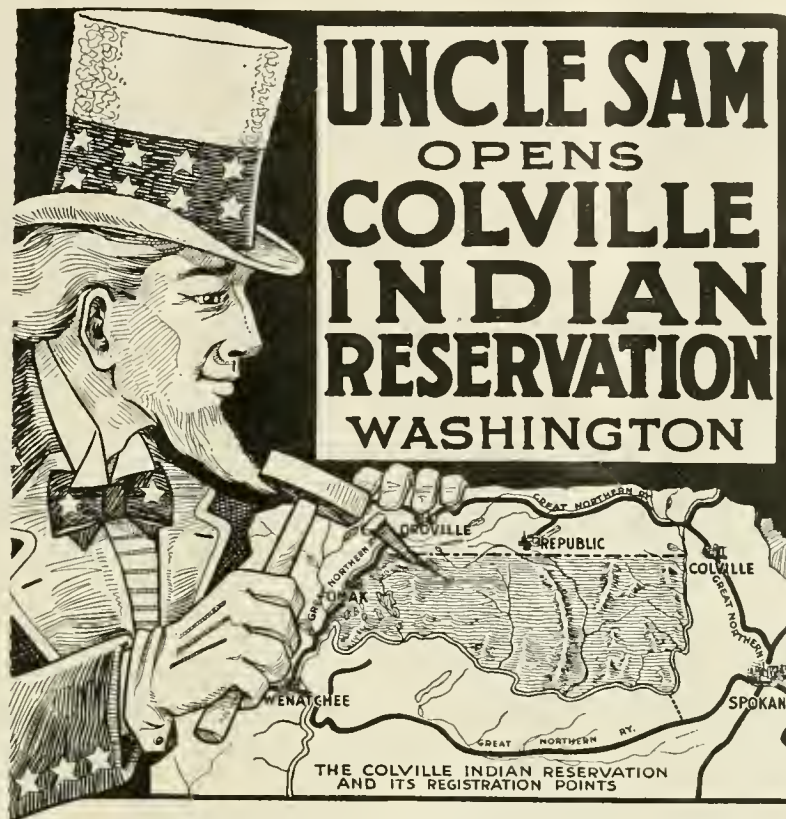
LUTHER MANUFACTURING CO.
San Francisco, California

Italian Bees and Queens

Write for circular to

IRA C. SMITH
DUNDEE, OREGON

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



"Go Great Northern"—on Fare-and-a-third Lake Chelan Tickets—and Register at Wenatchee or Omak—July 5th to 22nd, inclusive

350,000 acres of desirable agricultural lands of the south half of the COLVILLE Indian Reservation—located in the Columbia River and Okanogan Valleys of North-Central Washington—will be subject to homestead entry. "Go Great Northern" and take advantage of very low Lake Chelan fares—approximately a fare-and-a-third for the round trip and good for stopover for registration at Wenatchee—on sale daily from all Great Northern stations in British Columbia, Oregon, Washington and Idaho. If you like, at Chelan Station, you may rebuy to the registration town of Omak and back, directly at the Reservation. Great Northern Round Trip Summer Tourist Fares East during the registration period permit stopover for registration at Wenatchee or Spokane; also at Glacier National Park.

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Fill out coupon below and mail today, for detailed information, map folders and booklets.

F. W. GRAHAM M. J. COSTELLO C. W. MELDRUM
Western Immigration Agent Assistant Traffic Manager Asst. Gen'l Pass'r Agent
SEATTLE SEATTLE SEATTLE



C. W. MELDRUM, ASSISTANT GENERAL PASSENGER AGENT
GREAT NORTHERN RAILWAY, SEATTLE, WASH.
Send Colville Map Folder.

Name.....
Address.....

It is believed by some that the present pint used in packing strawberries is reducing the quantity of berries that are canned for domestic purposes, therefore some growers are advocating returning to the quart boxes.

Yakima reported on hand 150 cars of apples on April 28th. The demand for apples is pretty light in May and June, these two months being the lowest months for consumption of the year.

Puyallup Valley reports that many Evergreen blackberry and raspberry canes were damaged by frost.

Information from the Yakima Valley states that The California Fruit Distributors will enter the Yakima Valley, opening an office in charge of Mr. F. W. Means. It is stated that the business will be conducted under the name of the Producers' Fruit Company.

Box Nailing Machines

1 No. 5 Morgan, \$210

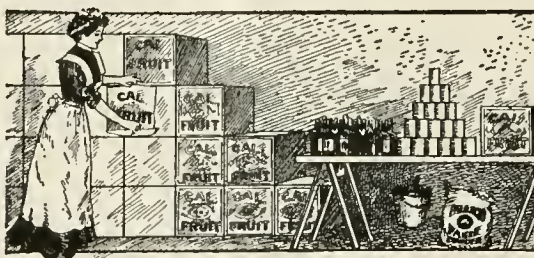
2 No. 8 Morgans, \$260 and \$275 each

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311 Front Street, Portland, Oregon

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



PASTE



GUM



PICK UP GUM, for use on Knapp labeling machines (very adhesive)
CEMENT, for use on Burt labeling machines. **LABELING GUM**, for use on all bottle labeling machines.
CELLULOID TIN LABELING PASTE, a RUST proof tin labeling paste.
TRANSPARENT PASTE, for bottle or jar labeling.
PALO ALTO PASTE POWDER—three pounds added to cold water makes two gallons fine white paste for all labeling work, or a RIBBON paste for labeling machines. Extensively used by canners and fruit packers.

Robinson Chemical Works

Manufacturers of Paste and Adhesives for All Purposes
 Office: 351 Eighth Street, San Francisco

By-Products and Principal Products of Fruit Business


Leon D. Batchelor, of University of California Citrus Experiment Station, Riverside, before Utah Farmers' Convention, January 28, 1916

BY-PRODUCTS are defined by the Dictionary of Political Economy as "those materials which in the cultivation or manufacture of any given commodity remain over, and which possess or can be brought to possess a market value of their own." By common usage, however, the term "by-product" has come to be used in speaking of any of the manufactured fruit products, as jams, jellies, canned fruit, and even evaporated fruit. This is an erroneous use of the term in many

cases, and has led to a misunderstanding of its importance, for frequently the products of a fruit section are spoken of as by-products simply because they are canned or preserved in some way, but are in fact the principal product and not a by-product.

During the past two years writers have frequently referred to California as an example of the successful development of fruit by-product industries. In most cases this has been rather misleading, due to the loose usage of terms, for the extensive canning and evaporating industries which have grown up in that state have been developed as the principal means of marketing the fruit. It is true, of course, that curing fruit does, to a limited extent, save from loss fruit for which shippers and canners are not at the time paying profitable prices, and it is also true that the recourse to curing frees growers from helpless dependence upon fresh-fruit buyers. But this does not mean that curing is a way of getting something from refuse fruit, not suited for other purposes. It should be taken as evidence that, for the most part, grades of fruit which are preserved are the same which are also available for shipping and canning when prices are right. It is very important in many ways to have it clearly understood that, except to an insignificant extent, California fruit drying is not undertaken to save wastes or to get something from fruit fruit which is not suited to higher uses. The obligations upon producers, to make their output worthy of a high standing, has extended to the whole process of growing. The fruit must be well grown with the added excellence of being somewhat more mature than for shipping purposes, because it is not required to stand hauling and storage. It must, however, be carefully handled to escape bruising because discolorations are blemishes.

The great success of California in the production of cured fruit lies chiefly in the favorable climatic conditions which prevail during the harvesting period. There are many parts of the world where good fruit is grown, but there are very few sections where conditions producing such fruit continue to accomplish its preservation. California's cured and canned deciduous



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DOUBLE SERVICE
Automobile Tires
Guaranteed 7,000 Miles Service
Absolutely Punctureproof

Double Service Tires are made double the thickness of the best standard make tires. This 100% greater wearing surface naturally gives that much more mileage and service. The average of 12 miles of tough fabric and one inch surface tread rubber makes these tires absolutely punctureproof.

These tires excel all others for use in the country over rough and rugged roads as well as on hard pavements. They are as easy riding and resilient as any other pneumatic tire—the air space and pressure being the same.


They are the most economical and "care free" tires made and are used where tires must be depended on and tire troubles cannot be tolerated. Many Double Service style tires are in use in the U. S. government and European War service. Our output is limited to a certain amount, but for a short time we offer the following reduced special prices as an introductory offer:

PRICES			
Tires Tubes		Tires Tubes	
30x3 in.	\$8.60 \$2.80	36x4 in.	\$17.45 \$4.65
30x3 1/2 in.	10.85 3.10	36x4 1/2 in.	21.20 5.60
32x3 1/2 in.	12.75 3.20	36x4 3/4 in.	22.60 5.75
34x4 in.	15.75 4.20	38x4 1/2 in.	23.60 6.20
34x4 in.	16.70 4.35	38x5 in.	25.30 6.60

All other sizes not included in above list also furnished. Non-skids at 10% additional. Terms: Payment with order at above special prices, a 10% discount allowed on orders for two or more tires. All personal checks must be certified.

Try these tires now and be convinced of their very high qualities. Sold direct to the consumer only. Descriptive folder upon request. Write for it.

Double Service Tire & Rubber Co., Akron, O.
 Dept. B. F.



WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

PORTLAND-SAN FRANCISCO
ROUND TRIP

\$32.00

Daily to July 31
 Includes Meals and Berth at Sea

THE NORTH BANK ROAD

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and Northern Pacific

EVERY

Tuesday, Thursday, Saturday

Through sleeping cars to Flavel Dock from Tacoma, Seattle and Vancouver, B. C., via Great Northern and Northern Pacific Rys.

Go East during the special Round Trip Summer Fares.

Direct or one way through California. Stopovers each way.

Vacation rates to Clatsop Beach, the favorite Northwest Seashore Resort.

Portland Ticket Office, Fifth and Stark
 Spokane, Davenport Hotel

R. H. CROZIER, Asst. Gen. Pass. Agent



WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

fruit amounted to seventy-one per cent of the total valuation of deciduous fruit produced in the state, according to the last census. Only in regions having a sufficiently warm and dry climate, as Greece, Turkey, parts of France, Spain and California is sun curing of fruit practiced on a commercial scale. Fruit may also be cured in drying devices known as evaporators; in which case the product is known as evaporated fruit, while the sun-cured fruit is usually spoken of as dried fruit. About three-fourths of the cured fruit produced in this country is sun dried and probably always will be, for the only limitation to the curing is the number of acres of sunshine in the favored sections of the arid states. Drying, therefore, is a more economical process of curing than evaporation.

The second great fruit canning and curing state is New York, and a brief consideration of apple evaporation in this state may be of interest at this time. This industry approaches more nearly the by-product side of the fruit business than most fruit-preserving industries. In writing on this subject, in BETTER FRUIT, Mr. D. W. Seely of Sodus Point, Wayne County, New York, writes as follows: "Until recent years in Wayne County, New York, practically everything was dried, and this made a very fine grade of evaporated fruit which commanded a big price, and still does." It is interesting to note further in Mr. Seely's discussion that the growers actually received for their crop during the year 1912, from 30 to 35 cents per hundred. The apples evaporated down to about thirteen pounds per hundred on the average and sold for six cents per pound. In speaking of an evaporator with a ninety bushel daily capacity the same authority quotes the following interesting figures:

Cost of 90 bushels of apples.....\$15.00
Cost of evaporation, including labor, fuel,
sulphur and overseeing 12.00

\$27.00

575 lbs. of evaporated apples at 6 cents;
about 280 lbs. of waste at 95%\$37.08
Net profit in handling 90 bushels apples
(not considering taxes, depreciation
and interest on dryer), one day's run... 10.00

Under the assumption of a plant of this size being owned by a non-profit co-operative association the growers would have received 27.8 cents per bushel for their apples instead of about 16.5 cents per bushel, or \$6.60 per ton selling to the evaporator.

The writer is not aware of any summarization of the operative costs in a large number of factories. The above account, however, was written as typical of the largest evaporated apple area in the United States. Again, wholesale prices fluctuate both above and below the rate (6 cents per pound) hitherto mentioned. At present the highest grades of evaporated apples are quoted from 6½ to 7½ cents per pound in the San Francisco markets, while last summer the figures fell to about 5 cents per pound. The latest reports from New York show that in a ten-year average, growers received for apples that went jointly to evaporators and vinegar plants \$10 per ton.

Ridley, Houlding & Co.

COVENT GARDEN, LONDON

Points to remember when consigning
apples to the London Market

1.—We Specialize in Apples

2.—All Consignments Receive our
Personal Attention

3.—The Fruit is Sold by
Private Treaty

CABLE ADDRESS: BOTANIZING, LONDON

F. W. BALTES AND COMPANY

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Unexcelled facilities for the production of Catalogues, Booklets, Stationery, Posters and Advertising Matter. Write us for prices and specifications. Out-of-town orders executed promptly and accurately. We print BETTER FRUIT.

CORNER FIRST AND OAK STREETS
PORTLAND, OREGON

New York is the greatest of all apple-producing districts and produces more dried apples for export than any other state, and if this section of the country is to compete with them in the foreign markets, probabilities are that we are not likely to receive a price in excess of \$10 per ton. It should be observed here that the grades of fruit acceptable for curing do not correspond to the so-called culls of the Western States region, but approach more nearly "C" and Fancy grades. Taking apples as an example, such fruit as that which has been shipped in bags or loose to Southern cotton states would be the lowest grades fit for curing. Partly



GRADERS

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Information

Western Fruit
Grader & Mfg.
Co.
Grand Junction
Colorado

SECOND SEASON
Send to Holland with Me
For Hyacinths, Tulips, Narcissus, Crocus, Iris,
Paeonias and other DUTCH BULBS.
Save 25% to 50
Write for details and price list.
N. B.—Order mailed August 1st.
C. G. EHLE (Box F) MULTNOMAH, OREGON

TOP DRESS all your Crops with **Nitrate of Soda** alone, no matter what other fertilizers you may have used. 100 pounds to the acre for seeded, and 200 pounds to the acre for cultivated crops will do the work. The increase will yield large profits over the cost.

Write on post card for our money making books

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Would you build a house with a foundation like this? Would an iron kettle hold water better if the bottom were cut and patched on again like this?

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My 250-page free catalog tells you why I sell direct to user, at wholesale sale, these and other implements, built in my own factories at Waterloo, at prices one-third to one-half less than you usually pay for first-class goods. All sizes, styles and prices of separators, engines and spreaders. My Farmobile (tractor) has no equal for simplicity and efficiency. Write what you need. 250,000 customers testify to quality of the Galloway line of goods. Write today for your free copy of this wonderful book of bargains for farm and household.

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Larger than runway; jaws pull rodent in; catches large or small gopher and holds it. Farmers say it's worth dozen other makes.

81¢ sales. Price 50¢. If not at your dealer's will send 1 to you postpaid; 2 for 95¢; 6 for \$2.70; 12 for \$5.10. Money back if you are not satisfied. Free circulars.

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decayed, wormy and badly-bruised apples are unsatisfactory for the purpose, making only the low grades of evaporated stock known as waste and chops. These low grades are quoted at present in the Rochester, New York, markets (Fruit and Produce Marketer, page 9, January 6, 1916) at from 2¼ to 3¼ cents per pound. With the cost of evaporation at about 2 cents per pound of evaporated fruit, and from 12 to 15 pounds of cured fruit per 100 pounds of green fruit, such low-grade apples would only net about 12 to 15 cents per hundred, if the growers owned their own evaporators. It is only the good-to-medium grades of fresh fruit which will bring the top prices as cured fruit. This class includes medium-sized, poorly-colored, limb-rubbed, top-sided and slightly-bruised fruit, but practically sound and edible when received at the factory or dryer. This is much the same type of fruit demanded for canning, and at about the same prices as quoted for canning purposes.

Turning now to the lowest grade or cull fruit, there are several possibilities for its disposal; it may be made into vinegar, denatured alcohol, or used as stock feed. The prices usually realized for vinegar apples, of from \$2 to \$5 per ton, may not warrant their special harvest during the rush season of picking and packing the higher-grade fruit. The culls which come from the orchard to the packing house, however, mixed with better fruit, might be profitably utilized for vinegar purposes inasmuch as they have already been harvested and assembled at a central point. A portion of this fruit usually is even adapted to evaporation or canning, so the average value to the grower might approach \$5 to \$8 per ton, providing it could be handled through a non-profit co-operative fruit-growers' association. Even with low-grade fruit which reaches the packing houses taken care of, there are still many tons remaining on the ground in the average orchard which should be utilized as stock feed, and here lies the most practical disposition of most of the real waste fruit of the orchard, unless denatured alcohol enterprises are established to consume such fruit at prices paying something more than cost of handling.

In considering the value of the several fruits compared to grain and hay as stock feed, the accompanying table, prepared by Professor Jaffa of the University of California, is interesting.

100 POUNDS FRUIT EQUIVALENT TO POUNDS FOR													
Fresh Fruits	Wheat Straw	Alfalfa Hay	Oat Hay	Corn	Barley	Oats	Wheat	Wheat Bran	Wheat Mid-dlings	Rice Bran	Cotton-seed Meal	Cocoa-nut Cake	Meal
Apples	34	20	24	15	15	17	16	18	16	13	9	13	
Oranges	33	19	23	14	11	16	15	17	15	12	8	12	
Pears	40	23	30	17	18	20	19	20	19	15	11	15	
Plums	50	30	36	22	24	25	24	26	24	20	14	20	
Prunes	46	27	33	20	22	23	22	24	22	18	13	18	
Apricots	40	23	29	17	18	20	19	20	19	15	11	15	
Nectarines	43	26	30	19	20	22	21	23	21	17	12	17	
Figs	50	30	37	23	24	26	25	27	25	20	14	20	
Grapes	50	30	37	23	24	26	25	27	25	20	14	20	
Watermelons	22	13	16	10	10	11	11	12	11	8	6	8	
Netmeg melons	19	11	13	8	9	9	9	10	9	7	5	7	
Dried Fruits													
Dried prunes	175	104	125	78	82	88	84	92	84	67	48	68	
Dried apricots	191	115	138	86	90	97	93	102	93	74	53	76	
Dried peaches	190	113	135	85	88	95	91	100	91	72	51	71	
Dried figs	186	110	132	83	85	93	89	97	89	71	50	72	
Raisins	216	128	153	97	100	108	103	111	103	82	59	81	

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Engine "WHY?" Book

One of the cleverest little books on engines that has ever been published, has just been printed by Mr. Ed. H. Witte, a Kansas City engine expert. He says that while the supply of books lasts, he will be glad to send anyone who is interested a copy of this book, which is called "Why?" Just write "Why" with your name and address on a postal or scrap of paper and address Mr. Witte, 188S Oakland Ave., Kansas City, Mo. (Adv.)

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The time is now just right for tying fruit trees. Tie the interior of the tree before the leaves are out and the exterior can be tied later. Orchard Yarn is put up in 5 lb. balls, 10 balls to a sack. This form is more convenient for use as the ball can be placed in the tree and by pulling the yarn from the inside it never tangles. 2-ply contains about 100 feet per pound.

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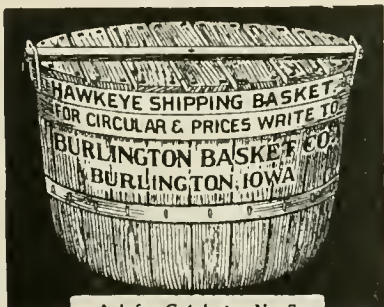
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Of course these valuations must be accorded some latitude, as they are based on averages. Certain varieties of the sweet and ripe apples may contain more nutrition than the more acid or immature fruit, and similar variations will be met with in considering the hays and grains. Likewise the comparisons are not based on exact equivalents of carbohydrates, proteins, etc., but the table nevertheless serves as a useful guide in pointing out the value of certain fruits as good for farm animals. Their value may be further diminished or increased, depending on the materials fed with the fruit.

The following experiences cited from Henry's "Feeds and Feeding" (Eleventh edition, page 195) throws additional light on the value of apples as a stock feed: "Withycombe of the Oregon Station fed three shoats all the apples they would eat, 897 pounds of apples producing 38 pounds of gain in 14 days. During the second period of 15 days, 1,119 pounds of apples gave only 3 pounds of gain. In another trial lasting 79 days 3 sows showed a gain of 36 pounds, or 1 pound of increase for each 64 pounds of apples fed. Clark of the Utah Station found that: 'Apples fed to pigs in two experiments with skim milk and shorts had a value ranging from nothing to 18 cents per hundredweight. In one trial apples were only equal to grass pasture.' From trials with dairy cows at the Vermont Station, Hills concludes that apples have about 40 per cent of the feeding value of corn silage. Lindsey of the Massachusetts (Hatch) Station concluded that 4 pounds of apple pomace equals 1 pound of good hay for cows. From 15 to 30 pounds of pomace may be fed daily to cows with advantage." Many fruitgrowers are producing hogs in the orchard with little or no grain up to the fattening period. This is especially practical in the irrigated regions where a portion of the orchard can be kept in alfalfa sod. By rotation of the alfalfa portion of the orchard sufficient hog feed can be produced to balance the fruit ration and not lower the production of the orchard. There is, in fact, a decided leaning toward cover crops and periods of sod rotation in many of the orchard sections of the West, regardless of the hog and by-product question.

In closing, we should keep in mind that the peach and apricot drying and canning of California, or the pruned evaporation industry of both Oregon and California, are the preparation of fruit for market as a principal product and not as a by-product. Such industries are making use of the best grades of fruit possible to grow and the Western fruitgrower should not necessarily consider the California peaches and apricots, or the New York jams and jellies seen in the grocery store as by-products, in the majority of cases, for the fruit was far from being cull fruit, but rather was very probably the equal of the best grades of fresh fruit grown in the country and produced especially for preserving. If the importation of manufactured fruit prod-

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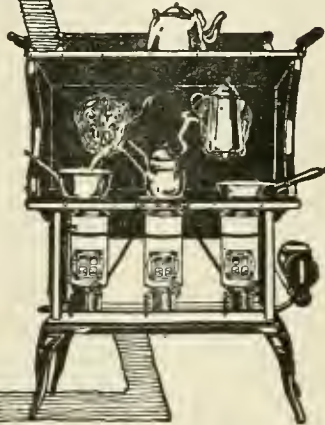
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ucts is to be diminished by home production, equally as good grades of preserved fruits must be put up, and a constant supply of such. Much of the success of establishing a brand of canned or dried fruit depends on its continued appearance on the market. This cannot be kept up unless the factory can be assured of suitable fruit far in advance of the preserving season; this can hardly be accomplished if the growers are gambling on the fresh-fruit market with intentions of turning to the factory at the last minute if market conditions are unfavorable. The fruit-preserving industry, where it is carried on most successfully, is not a catch-all for unsalable fruit, a place where culls are converted by some magic power into first-class products, it is not a means of saving bad fruit, but rather a means by which good fruit is prevented from becoming bad. These facts should in nowise discourage the fruitgrower of the Western States in the establishment of fruit-preservation factories. After a thorough trial of selling the fresh fruit, especially the stone fruits, to the general markets it may be proven that the sale of such fruit as a processed article would have been more profitable. If such condition should prevail it seems reasonable, however, from the experience of other regions that the chances of success of such factories may be greatly increased as the product of the industry becomes more of a principal product and less of a by-product.

The Fruit Industry Paraphrased

Loganberry Juice Advancing.—On account of the popular demand, which is increasing, for loganberry juice, the present stocks are scarce, therefore on July 1st the price will be increased 25 cents per case. At present 14-ounce cases sell at \$5.00, 16-ounce cases at \$4.50 and one-quart cases at \$4.00. The loganberry has made its way more rapidly into popularity in the last year through loganberry juice and loganberry pies than any other fruit in the same length of time.

The International Apple Shippers' Association will meet in New York City during the month of August. Some mighty interesting information should be obtainable as a result of the deliberations, not only in reference to the quantity of apples to be handled this year, but as to the best methods to be used to sell them to the best advantage.

The Walla Walla, Washington, Gardeners' Association commenced early in May with a membership of 95 and headquarters in Walla Walla. Even the gardeners believe in association work and are finding co-operation a necessity.

The Spokane Fruit Growers' Company will undertake this year to take a tree census of the number and age of all trees and varieties in every orchard. Special blanks will be used for this purpose.

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FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON

Would you plant your fruit trees in large tubs?

"Without the use of dynamite in tree-planting," says U. S. Bulletin No. 38, "the roots soon meet with the smooth and compacted sides of the hole, through which they have great difficulty in penetrating. The tree is in about the same situation as if it had been planted in a large tub."

But when you plant your trees in holes blasted with

GIANT FARM POWDERS STUMPING — AGRICULTURAL

the trees will grow faster, develop deeper, stronger roots, and bear earlier. "When dynamite is used," continues the bulletin, "cracks are formed in the soil to distances of five or sometimes six feet on all sides. This makes the very best conditions for the continued growth of the tree. For tree planting dynamite is recommended confidently as the best method of preparing the soil.

In selecting explosives for your orchard work, be careful to get those that will crack, pulverize and loosen the soil for several feet in every direction, rather than pack it or throw it in the air. The proper explosives are the Giant Farm Powders. There are two of these—Eureka Stumping Powder and Giant Stumping Powder—both *improved forms* of dynamite.

Fruit growers in all of the Western States use many tons of Giant Farm Powders every year. They have found that they do better work because they are made especially to suit *western* farm conditions and because they are always uniform in composition and action.

Giant Farm Powders—the product of the oldest manufacturer of high explosives in the United States—are the only genuine "giant powders" for agricultural use. Because Giant Powders are best known everywhere, many have assumed that all high explosives are Giant Powders. Insist upon having the genuine, made only by the Giant Powder Co., Con. If your dealer has only ordinary dynamites, write us and we will see that you get the genuine.

Book, "Better Orchard Tillage," FREE

Practical, valuable information on improved methods of planting and cultivating fruit trees is contained in this illustrated book. Other books on stump blasting, subsoiling, ditching and boulder blasting are also free. Choose the books you want and mail the coupon.

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73 New Ideas

Mitchell
SIX

\$1325 f. o. b. Racine
26 Extra Features

700 Improvements

Made by John W. Bate, the Efficiency Engineer

The Mid-Year Mitchell is the 17th model which John W. Bate has built. He has worked out in those models 700 improvements, and all are now found in this car.

A Lifetime Car

What he has aimed at is a lifetime car. His genius is efficiency as applied to machines. And he says that a car should last like a watch.

Instead of heavy castings he believes in light steel made three times as strong. There are 440 parts in this New Mitchell which are either drop forged or steel stamped.

He believes in Chrome-Vanadium steel, and he uses a wealth in this Mitchell.

He believes in making each part as strong as need be, and then adding 50 per cent.

He believes in utter simplicity—in a car almost trouble-proof.

One result is this: One Bate-built Mitchell has run 218,734 miles. Six Mitchells have averaged 164,372 miles each. That is more than 30 years of ordinary service.

He has certainly come closer to a lifetime car than anyone else ever did.

10,000 Savings

In our factory Mr. Bate has made 10,000 savings. He has reduced our costs 50 per cent in five years.

He has done this by building a model plant—a plant which covers 45 acres. He has equipped it with thousands of time-saving machines. He has invested in this factory about \$5,000,000.

No other plant in the world could build this New Mitchell at anywhere near our price.

That is why, years ago, we brought John W. Bate here. And why we paid him his price to make this factory and car represent the last word in efficiency.

26 Costly Extras

You will find in this Mitchell 26 costly extras—wanted things which other cars omit. Things like a power tire pump, reversible headlights, cane-handle control, cantilever springs, etc.

There are 26 of those extras—each something you want. In other cars they would cost you an extra price. In the Mitchell they are free. All are paid for out of factory savings.

257 Cars in One

The Mid-Year Mitchell is the latest model out. It was not completed until after the New York Shows. Our experts and designers there examined 257 this-year models. And all the best new ideas from all of them are combined in this single car. It brings out 73 new touches in body, finish and equipment. It is the most complete car on exhibit.

Mitchell dealers everywhere are now showing this new model. It is the only car with all Mr. Bate's ideas. It is the greatest value ever given in a high-grade car. If you don't know your Mitchell dealer, ask us for his name.

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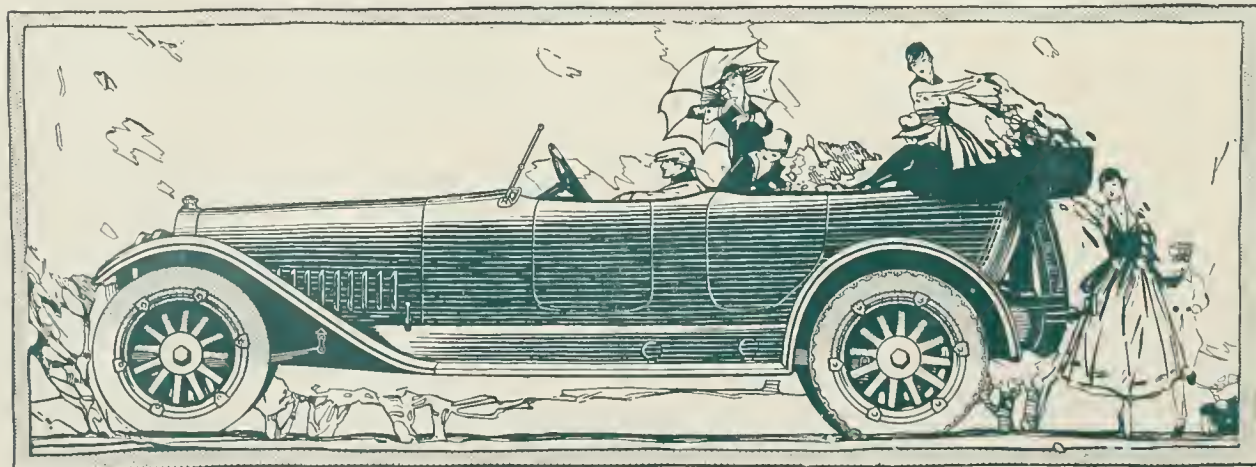
For 5-Passenger Touring Car or
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7-Passenger Touring Body \$35 Extra

High-speed, economical Six. 48 horsepower; 127-inch wheelbase; complete equipment, including 26 extra features.

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AUG 25 1916

BETTER FRUIT

VOLUME XI

AUGUST, 1916

NUMBER 2

ILLUSTRATED PACKING EDITION



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This Shows What Men Think of a Bate-Built Car

Most of the Mitchell sales in cities are made to very able men.

Our Chicago dealer, in one week, sold Mitchells to five big bankers. Our New York dealer—in the home of the critical—has ordered 2000 of this Mid-Year model.

Your nearest Mitchell dealer has a list of engineers—men of national fame—who selected the Mitchell. They chose this car, among 400 makes, because of its mechanical perfection.

Due to John W. Bate

The Mitchell's position among shrewd buyers is due to John W. Bate.

This great efficiency engineer designed all our factory buildings. They now cover 45 acres. He equipped those buildings with 2092 up-to-date machines. He trained our workmen.

The result is a model motor car plant. He has reduced our factory costs 50 per cent. No other plant in America, we think, could build such a car at our cost.

That is why such a car can be sold at our price. And why it includes 26 costly extras without any extra price.

Extra-Strong Parts

In the car itself Mr. Bate has worked out more than 700 improvements. He has spent 13 years on it. This is his 17th model.

Hardly a casting remains in it. But 440 parts are either drop-forged or stamped from toughened steel. He allows big margins of safety. He uses much Chrome-Vanadium steel. Important parts are all made oversize. The result seems to be a lifetime car. Six Mitchells have averaged 164,372 miles each, or over 30 years of ordinary service. And they are running still.

That is why men who get expert advice are buying this Mitchell now. They want a car which John W. Bate calls, "The best car I can build."

Now 73 New Touches

The Mid-Year Mitchell is our second 1916 model. It was completed after other new models came out. Our experts examined 257 of the latest models to get ideas for this.

So this Mid-Year Mitchell combines all the best attractions brought out in this year's cars.

In addition, it has 26 extra features—things other cars omit. Things like a power tire pump, cantilever springs, an extra-cost carburetor, an easy control, a ball-bearing steering gear, etc. You will find here the most complete car shown. You will find beauty, luxury and comfort in extreme. You will find the car which you will want when you buy a car to keep. Go see it. If you don't know your Mitchell dealer, ask us for his name.

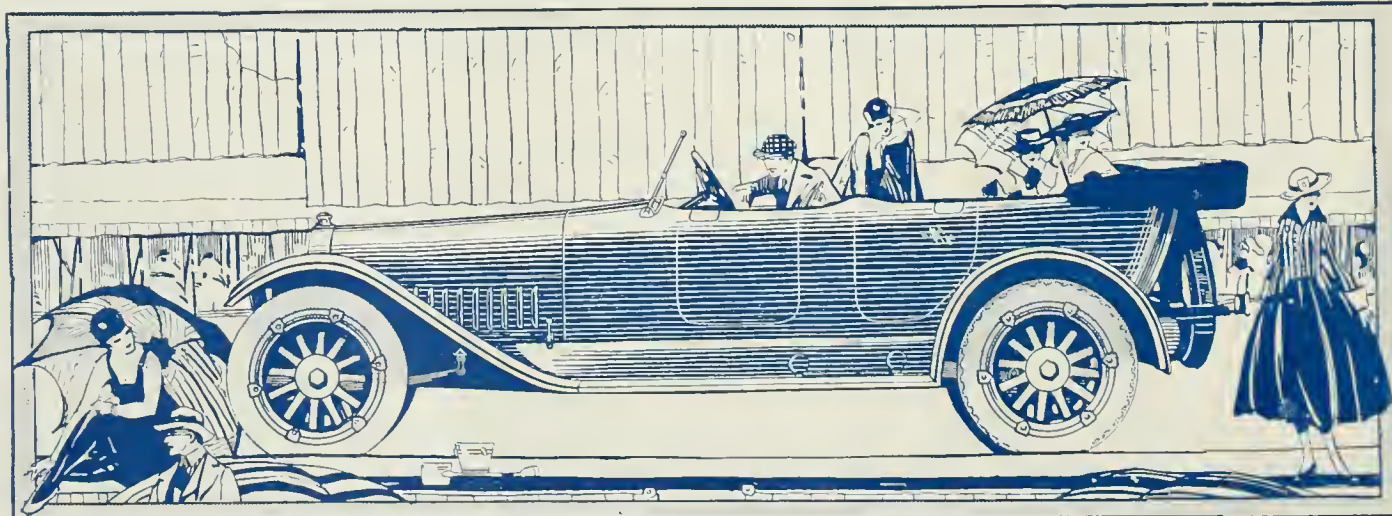
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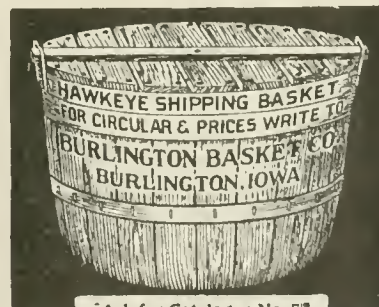
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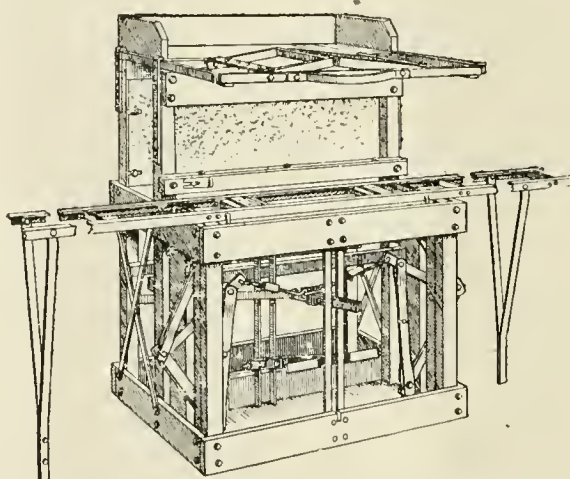
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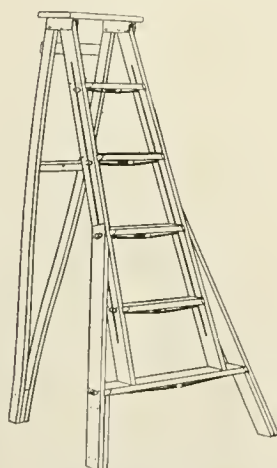
In the Northwestern Lid Press we offer you the maximum of speed in pressing and nailing up fruit boxes. The handling of the lids, placing same on the box and lining them up ready for pressing is automatic. It is provided with a reservoir holding 75 lids and a track on which the boxes come to the nailer. The time consumed in pressing is great-



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Stock lengths
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Price per ft. 35c

We here show two types of orchard ladders. Both are constructed of clear, well-seasoned spruce; thus possessing great strength while yet light in weight. They are both of well-chosen design; built to give you service and safety to the picker.



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Our complete catalog of orchard and packing house supplies should be in your hands. A postcard request will bring it.

The Hardie Manufacturing Company

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Packing Apples

By E. H. Shepard, Editor "Better Fruit," Hood River, Oregon.

BETTER FRUIT several years ago published the first edition of any horticultural paper devoted exclusively to packing apples, peaches, pears and cherries in boxes. Since then it has been the custom of "Better Fruit" to publish annually an edition devoted to packing. These editions have met with such splendid reception that it seemed wise to bring out a new edition on the subject each year, which has been done except in 1915. Since then so many requests have come in and the demand was so strong that it seems advisable to again devote space to this subject in this issue, in advance of the apple-packing season. Inasmuch as there are so many expert and trained packers in every section where apples are packed in boxes; it does not seem necessary to go into details as we usually have done in the past, and therefore in this issue we are presenting illustrations which show practically all of the commercial packs that are generally used at the present time, with two or three exceptions, namely, the 100 and 125 apples to the box. The 100 pack is composed of four rows of apples in a layer, with five apples to the row and five layers deep, making 100 apples to the box. The 125 pack is packed in a similar way, with five rows of apples, five apples to the row and five layers in a box, making a total of 125 apples to the box. These are the only two packs which have been introduced in recent years and are the only ones comparatively new.

Practically all apples are now packed diagonal pack. The Northwest has done away with the California Special, packing all of its apples in what is known as the Oregon Box or Northwest Standard, which is 10½ by 11½ by 18 inside measurement. With the illustrations in this number, it is comparatively a simple matter for any man, even with a limited experience in packing, to figure out how to put up each one of the different packs, as each illustration is an explanation in itself which is clearer than anything which

could be written. With these illustrations and the assistance of a trained packer, any man with an ordinarily good eye should be able to be a fairly good packer in a reasonably short time. Many inexperienced men in one season have learned not only to put up a first-class pack, but have gained sufficient speed so as to be able to pack anywhere from 50 to 80 boxes a day of ten hours.

The consumer, and the trade which is even more particular than the consumer, now demands a pack that is both standard and uniform. Uniformity refers more particularly to the size. Consequently packers should be very careful in putting up any of the packs to have all of the apples as near the same size as possible. Slight deviations in size are permissible where necessary at the end of the box, particularly on the top layer for the purpose of reducing the swell at the end so as to prevent bruising. Grading machines have become a big factor in developing more uniform packing. A number of good grading machines are now being made which will sort the apples almost perfectly as to size. Some machines are built on the measurement principle, while some grade on the weighing principle. The weighing principle is very reliable and the measuring principle is also very reliable, particularly where the measuring device is arranged so that all of the apples will be measured the same way. By that is meant, in order for the measuring machine to give exact results, it should measure all of the apples either from cheek to cheek or from stem to calyx. Some machines are built so as to measure both ways at the same time.

Packing is purely mechanical, and as already stated in this article, there are sufficient packers in the Northwest who understand the business sufficiently well to train any additional number that may be required to handle this year's crop. From an experienced packer, a novice in three or four days' instruction can learn the principles of packing sufficiently well to put up a

first-class packed box if he will only be careful in doing it to take his time about it. A novice should bear this in mind and never forget it: "Haste makes waste." In other words, if the novice endeavors to pack fast, his pack will be poor. Packing apples is like learning to write. You learn to write slowly but correctly; you must do so if you ever expect to write a good hand. It is the same with packing; you must learn to pack correctly, no matter how slow you go at first, if you ever expect to put up a good pack. If you follow this advice and go slowly, speed will come of itself and in a few weeks you will not only be able to put up a first-class pack but do it rapidly.

The other feature of packing which is of prime importance is grading. In many districts, the packer does his own grading. However, with the advent of the grading machines, experts on grading are now employed to grade the apples into the Extra Fancy, Fancy and C grade, relieving the packer of this responsibility to a certain extent, but the packer should always bear in mind that it is his duty, if he wants to be square with himself and the man he is working for, not to pass any apple in the grade that does not belong there.

Packing is pretty well understood; grading is not so well understood, and furthermore grading has never been as thoroughly and properly done in the past as it should be. Therefore it is to be hoped that this year will show marked improvement on grading apples. **Improvement is absolutely necessary. Three or four inferior apples in a box spoil the grade and reduce the value of the box to the value of the next lower grade.**

Experienced men should be used for grading. The grower is responsible for the grade. There is no job in the orchard which should have closer attention on the part of the grower than the job of grading. Grading is a matter of judgment, but there are rules and regulations covering it, so that any man who wants to can learn to grade and grade properly. There is nothing connected with harvesting a box of apples more important than making the grade correct and true. In other words, standardization is demanded by the consuming public, and if we expect to get the price for a box of Extra Fancy apples the grade must be absolutely Extra Fancy in every respect, without a single exception.

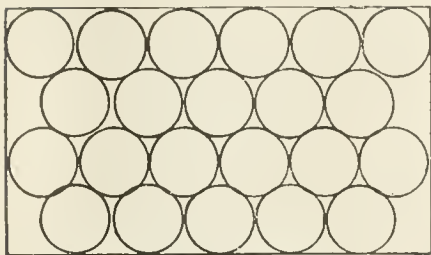
While discussing the subject of grading it also seems proper to discuss briefly the different grades. Extra Fancy, generally speaking, is fairly

Fancy Pack of Winter Nelis and Beurre Easter Pears. The sizes are as follows: Winter Nelis, 180, 5-tier; three boxes of Beurre Easter, sizes 68, 72 and 82, all 4-tier.

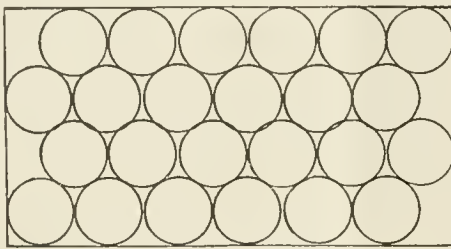
(Continued on page 7.)

Illustrations for Apple Packs in the Standard Apple Box

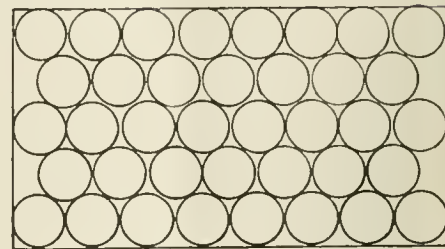
10½x11½x18 Inches, Inside Measurement



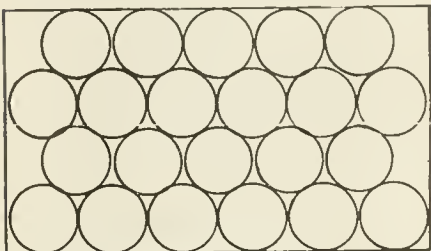
First and Third Layers



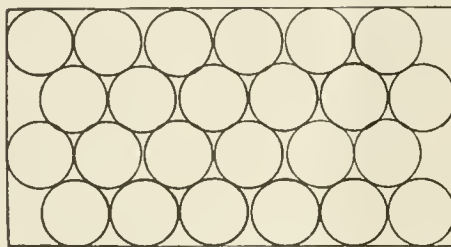
First and Third Layers



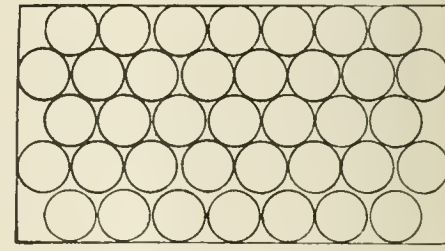
First, Third and Fifth Layers



Second and Fourth Layers
Diagonal 2/2 pack, 4 layers, 88 apples



Second and Fourth Layers
Showing diagonal 2/2 pack, 4 layers, 96 apples



Second and Fourth Layers
3/2 pack, 4½ tier, 5 layers, 188 apples
If layers are reversed there will be 187 apples

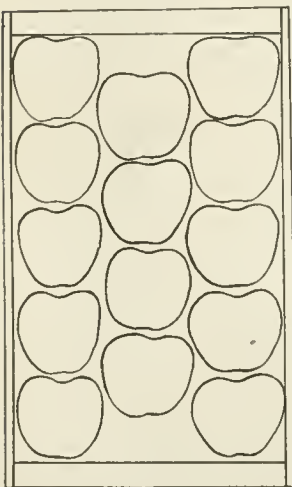


Figure 1—41 Apples
Northwest Standard Box

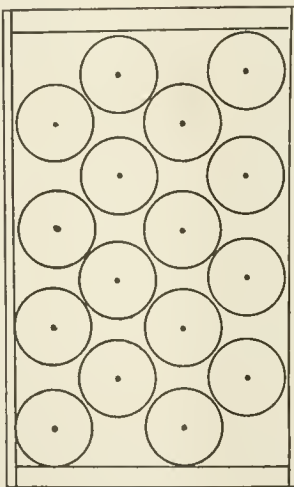


Figure 7—64 Apples
Northwest Standard Box

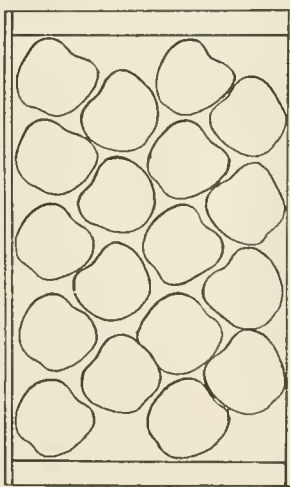


Figure 8—72 Apples
Northwest Standard Box

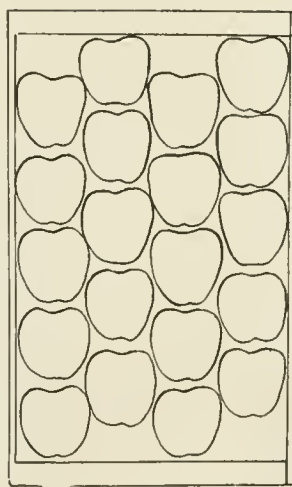


Figure 10—80 Apples
Northwest Standard Box

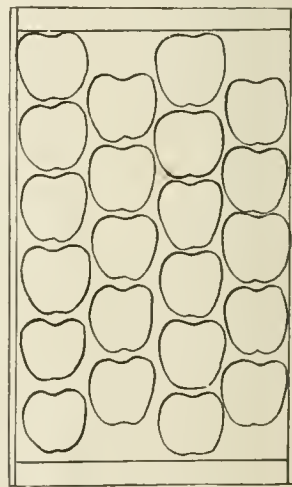


Figure 12—88 Apples
Northwest Standard Box

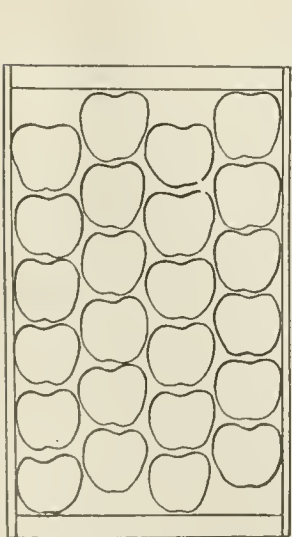


Figure 13—96 Apples
Northwest Standard Box

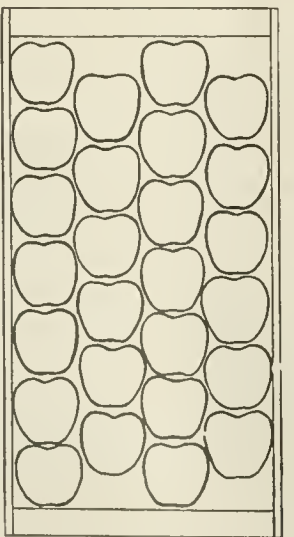


Figure 16—161 Apples
Northwest Standard Box

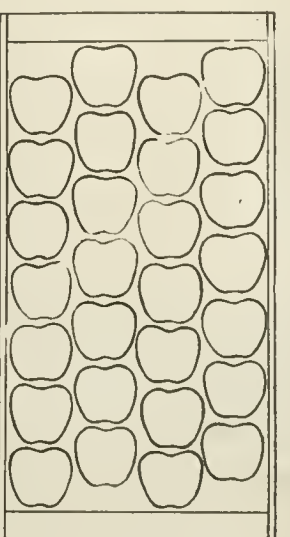


Figure 18—112 Apples
Northwest Standard Box

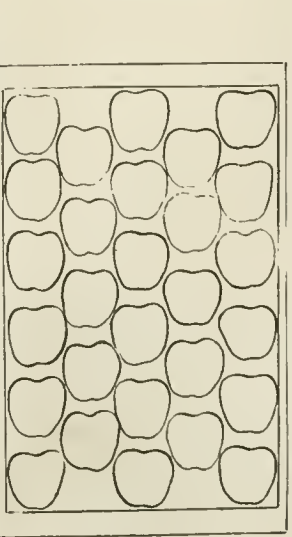


Figure 24—138 Apples
Northwest Standard Box

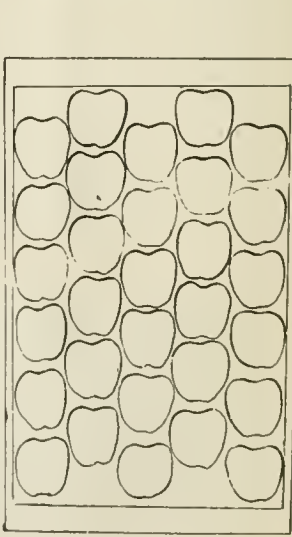


Figure 26—150 Apples
Northwest Standard Box

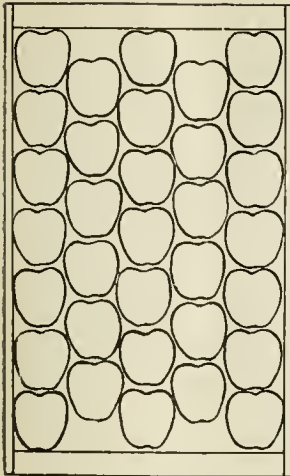


Figure 28—163 Apples
Northwest Standard Box

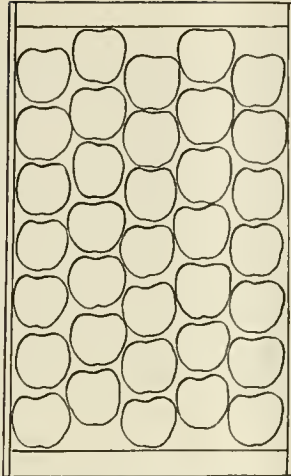


Figure 29—175 Apples
Northwest Standard Box

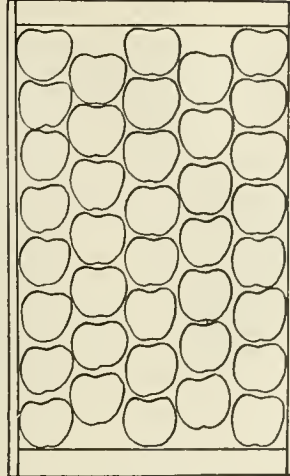
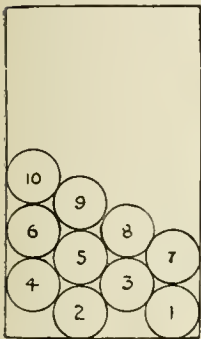
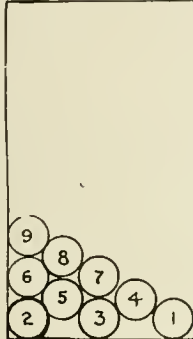


Figure 31—188 Apples
Northwest Standard Box



How to Start a 2/2
Diagonal Pack



Diagonal Pack
How to Start a 3/2

Packing Apples

(Continued from page 5.)

well done, but in the Fancy grade the grower usually falls down for the reason that he hates to see anything go into the C grade because the price is so much lower, but his worst fault probably is in the C grade, for the grower usually argues this way: "If this apple does not go into the C grade, it must go to the vinegar factory at only six dollars per ton." Extra Fancy and Fancy apples in average seasons usually bring the growers fair prices. The C grade seldom gives satisfactory returns. The reason for this is that usually in the C grade the grower puts in everything that is left after the Extra Fancy and Fancy are packed out. Consequently the C grade in past years has contained a lot of poor apples which were either badly affected by worm stings, aphids or fungus. If the fruit-growers of the Northwest expect to continue to put up a C grade and get back satisfactory returns after harvesting and selling expenses are taken out, they will have to bear this fact in mind: they must put a better C grade in 1916 than they have any year in the past. Careful investigations of returns on C-grade apples, particularly on ordinary varieties, lead to the conclusion that C grade pay the grower comparatively little, if any, profit. If a profit is to be made on C-grade apples, then more care must be taken in leaving out stung apples, aphid apples, fungus apples and others affected with any other kind of a disease.

The greater part of the apples produced in the Northwest are sold either in the Middle West, the South, the East or exported. Careful observation and investigation points to the final conclusion that if C grade is to be packed, it must be a better grade in the future than it has been in the past, for the reason that C grade, particularly in ordinary varieties, has not shown the grower a satisfactory net profit. There is a belief, which we have long entertained, which is growing constantly, that sometime in the near future the Northwest will decide, and decide wisely, to pack only two grades, the Extra Fancy and Fancy, the latter including in addition to Fancy the first-class apples of what now go in the C grade; the balance should be sent to the vinegar factory. This suggestion is thrown out in advance for consideration for the reason that it is our belief that sometime in the near future it will be the advisable method to adopt.

This year the Northwest is entering on a new era, so to speak, under the auspices of the Fruit Growers' Agency, originated, created and fathered by the Bureau of Markets in the Department

of Agriculture. We are going on the market under a uniform contract; we have taken a stand for uniform pack and standardization, and therefore it ought to be evident that we will be critically judged this year. If we make good this year, we will have established a reputation for uniformity and standardization. We must pack a product of known value. Every car should be standard so it can be sold on guarantee without inspection. The business world, the consumer, the government, are all demanding standardization. The Northwest has publicly stated that the Fruit Growers' Agency will supervise standardization. It is a critical year; the responsibility is on our shoulders, on every grower's shoulders, individually. **WE HAVE ASSUMED THE RESPONSIBILITY; WE MUST MAKE GOOD. WE CANNOT FAIL. WE WILL NOT FAIL.**

A large grower and operator of apples in one of the past issues of the Chicago Produce News advises growers to take up the matter of marketing and distribution now, instead of waiting until the harvesting time. Mighty good advice.

The Eugene Fruit Growers' Association, under the able managership of Mr. J. O. Holt, organized in 1908, doing a business of \$6000, has met with wonderful success, showing a volume of business done in 1915 of \$225,000.

The Winter Nelis pear crop is reported to have suffered more severely than any other variety of pear. Apparently the Winter Nelis will be scarce and will bring good prices.

The Libby, McNeill & Libby fruit cannery is a big factor for the fruit industry in the district surrounding The Dalles. There is nothing like a good cannery to help take care of the surplus and save the waste.



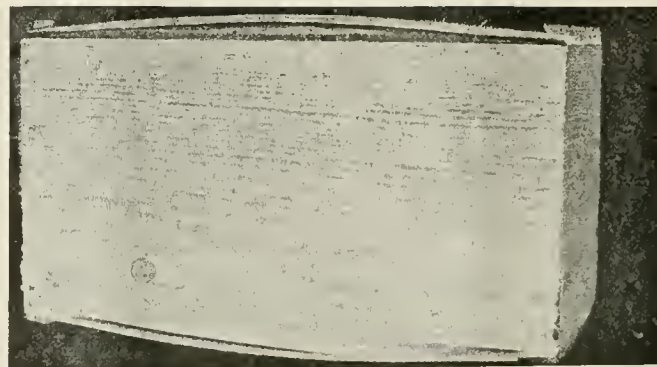
Anjou Pears



A Perfect Box of Bartlett Pears



Illustration showing a box of Winter Nelis 150, 5-tier, and Beurre Easter, 100, 4-tier.



Showing the proper bulge on a box nailed and ready for shipment

Securing Organic Matter in Orchard Soils

By J. R. Mattern, Julian, Pennsylvania

STARING every orchardist in the face is the problem of getting sufficient vegetable matter into his soil to keep up proper moisture and fertility conditions. It is a well-known fact among modern soil experts that organic matter has a great deal to do with the moisture storage capacity of soils, and in connection with moisture the organic matter determines the bacterial activity in the soil, and therefore the amount of natural plant food available.

On a grain or stock farm the problem is simpler, because there are no trees to hinder free cultivation with broad implements, and no roots to interfere with deep plowing. Once the trees are started, the ground cannot be plowed more than seven inches deep without damaging the roots. If manure is applied the weeds that spring from the seeds are exceedingly hard to kill by cultivation, and smothering crops cannot be used in an orchard as they can in an open field.

The one remaining method of securing the organic matter is by the use of cover crops, or what some educators call green-manure crops. The fundamental idea in this is to plant something that will make a luxuriant growth of tops and roots, and then work the material grown into the soil. Legumes such as crimson clover (where it will grow successfully), vetch, cow-peas, and soy beans are best when they can be grown, but sometimes the soil is too much run down, or too rough to permit of these finer plants catching. Rye, wheat, turnips, millet and other such plants then are better.

Still the chief problem is not solved, for attention to the top seven inches of soil that the plows will reach will not always grow a good orchard. It is necessary to get the organic matter deeper than this—down there is the real feeding place of the roots. Roots of the cover-crop plant alone can reach this soil, and they will not do so unless the way is opened for them by deep tillage. By subsoiling an orchard site with plows before the trees are planted, you can accomplish much good. A better way is to do it with explosives at the time the trees are

planted, and every five or ten years afterwards.

Too much importance cannot be attached to this subject of filling the soil with roots down deep, where they provide organic matter for bacteria to feed on, and to aid in both the storage of moisture and the liberation of insoluble plant foods. Only a few orchardists understand the value of the practice, but the experiences of these few are illuminating. Clean cultivation or intercrop practice, it makes no difference if the land is cultivated during the weeks from April till in July, just so the cover crop is sown each year, in soil that has been given intensive tillage down deep, there will be abundance of growth and overabundance of fruit.

A New Wave of Prosperity

It is most gratifying to note the preparations being made to save the by-products heretofore wasted by the Western fruitgrower. This has been brought about largely by the prohibition of liquor retailing in the several Northwestern States. Along the west slope and Willamette Valley a fortune has been spent in hydraulic presses and equipment for making loganberries into soft drinkable beverages. This means prosperity to our valley growers and profits to the several enterprising concerns that have equipped

themselves with plants for pressing and bottling. While the present season's crop of loganberries in the Willamette Valley represents a value in excess of a half million of dollars, it is small when compared with the by-products to be saved from apples. Evaporating Plants, Apple-Butter Cookers and Hydraulic Presses are all coming into great demand and the good old-time cider will be replaced by a more choice and higher grade of beverage made from the small or slightly under first-quality apples. The "Apple-Ju" produced by the leading Salem concern is strictly a high-grade beverage, sanitary, sparkling and delicious, and hundreds of tons of apples will find a profitable market value where heretofore they have been thrown away.

The fact that single contracts amounting to over twenty thousand dollars have been entered into this season for hydraulic-pressing machinery is proof of the importance of the preparations being made to save and turn the by-products into profit.

I will not attempt to go into lengthy details in this article, but should any reader desires to know more regarding the manufacturing of by-products and the proper equipment required for same, their inquiries will be given prompt attention if addressed to U. D. Maxson, 308 East Salmon Street, Portland, Oregon.—[Adv.]

Florida, up to the middle of April, had shipped 17,095 cars of oranges and 4741 cars of grapefruit.



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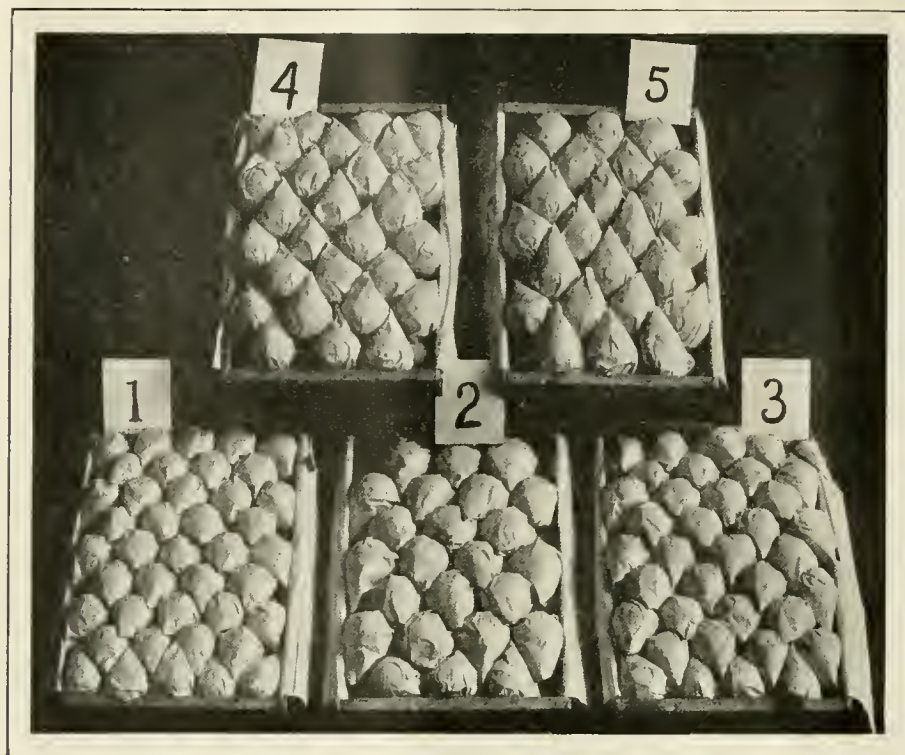
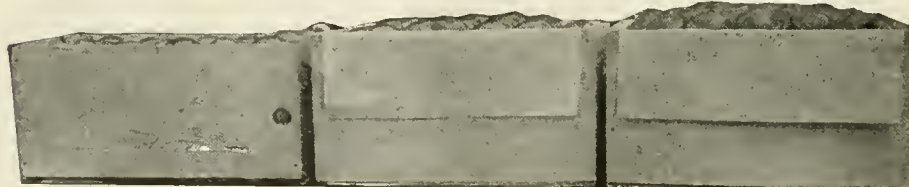


Photo by T. Gagnon, Wenatchee, Washington
Packed for the Longview Orchard Company, Wenatchee, Washington
(1) 200 pears; (2) 120 pears; (3) 180 pears; (4) 140 pears; (5) 96 pears



Three boxes of apples, showing one packed too low, one just right, and one too high

Handling Fruits for Distant Markets

[Office of Information, U. S. Department of Agriculture.]

THE importance of careful picking and handling in preventing decay in such fruits as cherries and prunes is brought out in Bulletin 331 of the United States Department of Agriculture, which contains a report of experiments conducted with these fruits in the Willamette Valley, Oregon. Hitherto it has not usually been found profitable to ship fresh cherries and prunes from this region to distant markets because of the unsatisfactory condition in which the products arrive. These investigations demonstrate that a great part of the decay can be prevented by

the exercise of proper care, but that unless care is exercised there is little hope of disposing of the fresh cherry and prune crop of this region in distant markets. The facts brought out in the investigation are believed to be applicable also to other sections of the country. The losses which shippers of cherries and prunes experience are due chiefly to brown rot and to other fungi which gain entrance through abrasions in the skin, or other injuries to the fruit. The brown rot must be controlled by proper orchard practice. On the other hand, the loss from those

forms of fungi which do not attack healthy, sound fruit can be minimized by careful handling.

In order to demonstrate this fact the investigators stored various lots of carefully-handled fruit and of commercially-handled fruit for varying periods in a refrigerator car, in which the conditions were made as nearly as possible identical with those under which the fruit would travel in actual commercial practice. At the end of five days in the iced car, the carefully-handled fruit showed an average of only 0.5 per cent of decay, while the commercially-handled fruit showed 2.8 per cent of decay, or practically six times the amount. At the end of ten days the carefully-handled fruit had 1.5 per cent of decay, and the commercially-handled lots 12.3 per cent, or eight times as much. Ten days is approximately the time required to ship fruit from the Willamette Valley to Chicago. Similar results were obtained from experiments with prunes, although with them the percentage of decay for both commercially-handled and carefully-handled fruit was smaller than with cherries. It is pointed out, however, that although every effort was made to have the conditions approximate those in actual transportation, it is probable that the fruit kept better in the iced car used for these tests than it would in the ordinary refrigerator car in transit.

Experiments were also conducted both with carefully-handled and commercially-handled fruit to determine the value of precooling before placing the fruit in the refrigerator car. These tests show that precooling is undoubtedly of value. On the other hand, it cannot be relied upon to prevent losses due to careless handling. Injured fruit will decay whether it is precooled or not, and for this reason precooling is not recommended unless it is preceded by adequate care in picking and packing. It is also pointed out that any delay between the picking and the shipping of fruit hastens decay. The amount of damage done in this way will vary, of course, with the weather conditions, but under any circumstances it is considerable.

In view of these facts it is recommended that every precaution should be taken in picking the fruit not to bruise it, and that it should be transferred as few times as possible from one container into another. While it is being held in the orchard after picking

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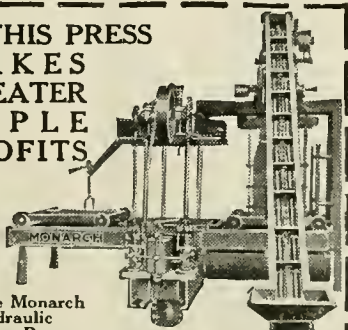
General Offices, 525 West Street, New York City

T. A. Adams, President

it should be kept in the shade and the hauling wagon should be provided with good springs and covered with canvas in order to keep off sun and dirt. In grading, all damaged fruit should be culled out, and as soon as the shipment has been packed it should be placed in the refrigerator car. The extra expense of careful handling, it is said, will be more than offset by the reduction of losses from decay and the ability of the fruit to maintain itself in good condition while exposed for sale. If these suggestions are adopted generally by fruitgrowers and in consequence a larger proportion of the crop marketed fresh, it is believed that the industry will benefit greatly and its extension will be made profitable. That this fact is being recognized by fruitgrowers is indicated by the co-operation afforded the Department in its investigation by the growers in the Willamette Valley.

The United States Department of Agriculture, through the Office of Markets and Rural Organization, has employed a large number of able men for investigation and market report work during the coming season. The government will open offices and carry on this work from some of the principal consuming centers in the United States, among which may be mentioned New York, Boston, Chicago, Philadelphia, Buffalo, Kansas City, St. Louis and Pittsburg. As rapidly as possible offices will be opened and the work carried on in a number of other important cities, which may include Cleveland, Detroit, Milwaukee, Sioux City, Des Moines, Indianapolis, Columbus, St. Paul and Denver. It is evident that the government has fully realized not only the importance and the value of the fruit industry, but the necessity of giving the fruitgrowers, marketing agencies and distributors all such information as is possible which will be helpful to them in marketing their crop to the best possible advantage. These offices will report the number of cars of different kinds of fruit arriving daily, and it is understood will give considerable information about prices as well.

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Hogs and Sheep in the Orchard

By Gordon G. Brown, Horticulturist, Hood River Experiment Station

THE question of the practicability of allowing hogs or sheep in the orchard for pasture is an old and mooted one, yet one on which additional light is being thrown each year. Data is being collected by the local Experiment Station which should enable the orchardist to judge for himself, approximately, the desirability or undesirability of such a plan under his own particular conditions. The fact that the 1915 report of this station is not yet in the hands of the growers causes the writer to feel that a few remarks on the subject will be in order here and at

this particular time. Undoubtedly here, as elsewhere, many orchardists will throw up their hands in horror at the suggestion of allowing hogs, and especially sheep, the privilege of unrestricted roaming in the sacred and respected domains inhabited by the fruit tree. This view is especially taken because of the well-known tendency of the former to root up the ground badly, and of the latter to eat the bark of the trees. However, experimental data collected locally indicates that there is much merit in the plan of hog or sheep pasturing of the orchard.

What are some of the advantages of such a plan? What are some of the economic factors as well as scientific factors involved, because upon these points the desirability or undesirability of the whole scheme rests? In other words, increasing the output of marketable products from a given area of land and with a given capital without unduly increasing the expenses involved are the features to be emphasized. Under certain conditions which the writer will attempt to enumerate the pasturing plan appears feasible and desirable under Hood River Valley conditions. Briefly, the advantages of pasturing the orchard may be summed up in the following manner: (1) All of the land is fully utilized. In other words, it is being fully employed for the production of readily marketable crops. (2) Leguminous manurial crops are usually grown which, when eaten, are returned to the soil in a quickly available form. (3) Unless pastured too closely there is sufficient crop to turn under for green manure after the season is over or the crops begin to run out. (4) Where legumes are grown their nitrogen-fixing abilities are to be recognized and appreciated. (5) Where crop is pastured labor is saved in cutting, curing and handling. (6) Where good animals and good pasture crops are provided, cheap and economical gains are made. (7) Green succulent pasture when thus utilized is worth more relatively than its market value after expensive labor has been used in putting it up in the form of hay. (8)

More products are secured from a given area without greatly increasing the cost. Hence increased net returns.

There are few conditions which usually obtain in the orchard itself that do not make such a plan feasible. Other factors such as housing, breeding, killing, marketing, etc., are not touched upon here. Of course in very young orchards where an abundance of succulent foliage and small limbs are directly exposed it is doubtful if it is advisable to turn other than very small shotes in for pasture. Also the whole subject must be viewed in the light

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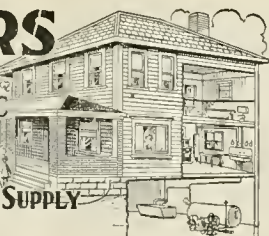
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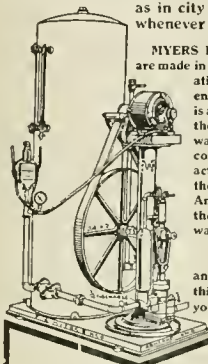
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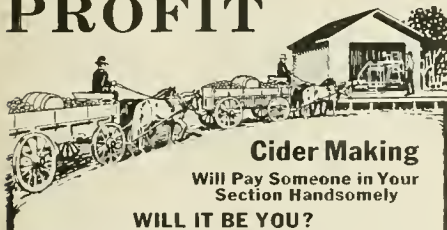


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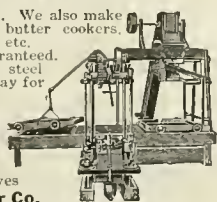
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HOOD RIVER, OREGON

of shade or cover crops and their manurial action, which is a big subject in itself and will not be discussed here. Usually where a cover or shade crop is sown primarily for green manurial purposes it is practical to pasture, as the manurial action is quickened. The subject of the availability of water for use both for pasture and fruit crop at the critical periods must also be viewed in the light of practical results. Just how such a plan will fit in with a permanent rotation in the orchard, labor distribution, etc., must also be considered.

The writer wishes to call attention to the observations made by the Hood River Experiment Station during the season of 1915 in the lower valley on sheep pasturing. Mr. R. W. Allen of the Umatilla Experiment Station was then in charge of the work. It will be well to observe that this is a class of animals which can be maintained without the use of grain and fattened for market solely on grain forage. Such being the case, it was thought desirable to note the gains made on the leguminous crops such as clover or alfalfa, and to study such other factors that indicate the desirability or undesirability of sheep pasturing in the orchard. It is important to note that owing to the shortage of sheep within reach of the district individuals were taken for the test that were considerably below normal in standard. The ewes wintered poorly and the lambs were small. On June 18, eight ewes and as many lambs were put on an acre of clover in a bearing apple orchard. At this time the ewes averaged 81 pounds each and the lambs 26 pounds each. At the end of twelve days the ewes showed an average of four and one-half pounds gain each, and the lambs fourteen and three-quarter pounds each. On August 9th, when the experiment terminated, the ewes had made a gain of three pounds each, while the lambs showed an average gain each of 63.7 pounds for the fifty-two-day period. This shows a daily gain of 1.2 pounds each during the entire period. Sixteen head of animals were kept for the first three weeks on one acre of clover. At the end of this time they were transferred to an area of equal extent for one week. During this time the clover was eaten approximately half off. Owing to the fact that the fence became broken no further data was collected and the animals given a wide range.

The experiment indicates that during the early season before the lambs are feeding extensively eight ewes and as many lambs may be kept on two acres of clover pasture; later three acres will be required. These are results of preliminary work here and it is hoped more trials may be made this year and further observations. Owing to the fact that sheep can be purchased in the spring not far from Hood River Valley, it appears feasible for them to be bought at this time, kept in the orchard pasture during the summer and sold in the fall. Tests made with hogs were even more favorable from an economic standpoint. In one experiment near

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Oak Grove, thirteen hogs were kept on a three-acre patch of clover until such time as an adjoining tract of field peas became ripe enough to be fed off. Both crops were in an orchard near bearing age. The thirteen hogs placed in this experiment weighed on an average of 73.5 pounds. They were pastured on clover without supplementary feed for thirty-two days. During this time they made an individual average gain of 18.5 pounds, or .57 pounds per day. In the succeeding thirty days they were fed rolled barley at the rate of one-half pound per hog daily. During this period the average gain was .44 pounds per hog. Owing to the fact that the animals made smaller gains during this period than the former period the relation of greater succulency during the early season's growth to quick and economical gains is obvious. This is important. In the fifty-eight succeeding days the animals ran on clover and pastured off the peas in the adjoining field. During this period they made an individual gain of .77 pounds per day. Thus the total gain per animal over a period of 127 days was 77.2 pounds, or .61 pounds per day. It is also worthy of note that 20 head of very small pigs also pastured with them during the entire time on clover. The exact amount of feed consumed, therefore, was not determined. However, the gain of .64 pounds daily per hog was very good considering the amount of grain fed, and indicates that there is profit in hogs in a normal season.

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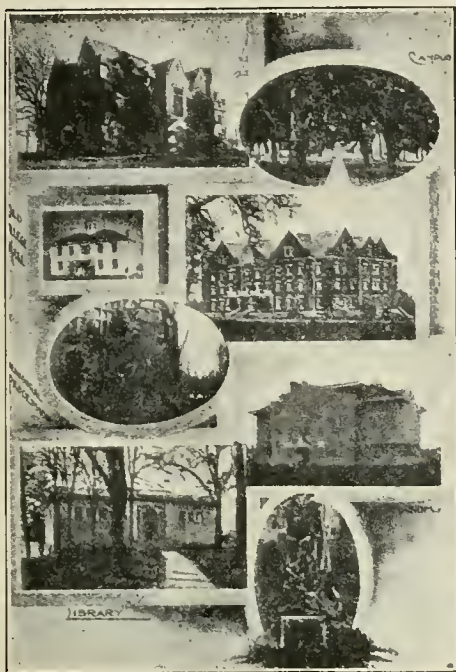
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It is to be emphasized that if quick and economical gains are to be made pastures must be succulent. This means getting the animals on the pasture early while this condition still obtains. This condition may be maintained for a long period if sufficient moisture is available and the field or pasture is given alternate periods of rest. This may be conveniently arranged by having two or three inclosures. These fields are then used alternately, the hogs remaining in each about a week or ten days. In the case of clover or alfalfa the growth is

allowed to become three or four inches high before the hogs are turned in to eat quickly. When the pasture consists of such crops as rape, kale and vetch, which will not stand such close grazing, the growth is permitted to reach a height of 8 to 10 inches before the animals are turned in. Changing the hogs from field to field gives the pasture a period of rest, during which the plants recuperate and grow rapidly. When the stock is returned to the field the forage is clean, tender, palatable and large quantities are consumed. Owing to the rapid growth made while at rest, a pasture that is subdivided and the areas grazed alternately is capable of carrying a much larger number of hogs per acre, other conditions being equal, than one that is continuously pastured. Hogs are inclined to root when the surface of the ground is wet or damp. For this reason the pasture, if under irrigation, is irrigated just after the hogs are changed from one pasture to another. This gives the surface of the ground time to dry before the forage is large enough to be grazed.

When conditions permit a grain crop may be desirable. This is especially true where there is a superabundance of moisture and the trees are making too much growth. Such a pasture is very desirable when the hogs are nearing the limit of growing period and the fattening period is begun. Such crops as wheat (soft club type), field peas and barley are splendid. These recommendations with reference to grain must be accepted cautiously, as conditions usually are not adapted in the orchard for crops of this kind. With legumes, however, the limitations are much less. An objection to the use of these animals usually is that they damage the trees and root up the ground. One method of avoiding this has already been suggested. Again, in such

cases this is due to having a poor grade of animals, consequently poor feeders are having a poor crop on which to feed. In either case, and especially where combined chances for success are small, a high-grade animal must be used and succulent feed provided if results are to be secured. After the fruit crop is beginning to mature it is advisable to remove the animals to another field, as it is at such times their tree-climbing and acrobatic tendencies receive the greatest stimulus. This is especially so with low-headed varieties such as Jonathan.

In closing the writer wishes to remind that observations in the valley are still in the preliminary state, and that tests will have to be made over a wide field and under varying conditions before even general recommendations may be made.

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of Congress of March 3, 1879.

The Fruit Marketing Agency.—Capt. Paul Weyrauch reports that 75 per cent of the tonnage of the Northwest has joined the Agency, which assures a successful organization. The Bureau of Markets, connected with the Department of Agriculture, has worked very strenuously and is to be congratulated on having given the Agency a successful start. It is reported that the government has spent \$10,000 in assisting to create this Agency. The cost to the growers, according to the budget, will be \$8500 for the first year, or not to exceed a maximum of \$1.00 per car. It is to be regretted, but nevertheless it is a fact, that growers have not been sufficiently informed in reference to the purpose of the Agency. No one is to blame for this. However, it is a fact that the local newspapers in the various fruit sections, as well as the big dailies, have not given sufficient publicity to the movement. It is impossible for the few government officials, in the limited time, to meet all of the growers and explain fully to them, although meetings were arranged for such purpose in various sections, but many of these notices did not have sufficient publicity and therefore the attendance was not such as it should be. The Uniform Contract and the By-Laws have been extensively published; these have been published in "Better Fruit," as well as in a number of other publications. Just a few words about the Fruit Growers' Agency seem in order now that the growers may understand briefly its purpose. The Agency is created for the purpose of assisting the fruitgrowers in the Northwest. One of the purposes will be to obtain and furnish the selling organizations with valuable estimates about the crops in all of the districts, to enable the selling organizations to better determine values. The Agency will receive and disseminate information to its members from the

Bureau of Markets, as to marketing conditions in all of the principal cities. This report will state the number of cars arriving daily, the number of cars on storage, and also state prices at which fruit is selling at the time of the report. The Agency will use its tonnage and influence to improve transportation facilities wherever possible. The Agency will aim to disseminate information that will prevent selling concerns from piling fruit into already glutted markets and also endeavor to give information in reference to markets not properly supplied, the opportunities for supplying them and the possible prices that may be obtained. In other words, the Agency will assist in giving information which will create a more intelligent and general distribution and better prices. All of this information will be of great value to the trustees and salesmen of the different organizations affiliated with the Exchange in determining actual sales values of different varieties of fruits and apples, which in itself ought to be a big factor in preventing unnecessary cutting of prices and unnecessary competition which has existed in the past. This partially covers the field of activities for the Fruit Growers' Agency for the coming season. Growers must not be unreasonable in their expectations and should bear in mind that in the first year the Agency can only reasonably be expected to make a fair start. One thing which many growers fail to understand is this fact. The Fruit Growers' Agency will not sell a box of apples for any selling concern or any individual grower. They will make no prices and in no way endeavor to arbitrarily fix the price of any kind of fruit or any variety. It is up to each selling organization to do this for itself just the same now as it has been in the past, but the Fruit Growers' Agency will be a big factor in helping them to do it more intelligently in the future.

1916 Apple Prices.—The June estimate of the government indicates 6 per cent less apples than the actual amount grown in 1915. It is to be borne in mind that many things may happen, and they usually do, between now and harvesting season to reduce the quantity estimated as early as June. It must be admitted, however, that occasionally the final harvesting is greater than the early estimates. So far, there is not a single apple-producing district in the United States that is reported heavy. Many are reported light. In 1914 the United States produced a bumper crop of 84,000,000 barrels. In 1915 the actual crop grown was estimated by the government at 76,000,000 barrels, or only 10 per cent less than in 1914, making two bumper crops in succession, which lessens the possibility of a third bumper crop in 1916. It seems reasonable at the present time to assume that the crop of the United States will be a moderate-sized crop, neither a heavy crop or a light crop. Business conditions have improved in many sections of the United States and there is every assurance to assume that the United States is on the eve of prosperity which

will continue for many years. Therefore at the present time the situation is such that there is good reason to believe that apples will sell for a fair price this year and pay the grower a satisfactory profit on his investment and for his work.

Hogs and Sheep in the Orchard.—Fruit districts where diversity farming has been more or less of a factor in connection with orcharding are a standing testimonial to the value of diversity in connection with the orchard business. It is a fact that where any district is engaged in or has gone into diversity in connection with orchard business, the district and the business condition of that district in a financial way is much better than in the fruit districts which have depended entirely upon fruit. There is nothing like a reasonable amount of diversity to help a fruitgrower out in the years when prices are low or in the years when the crop is light. Hogs and sheep

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have proved very profitable. Consequently it seems advisable to suggest to the fruitgrower who is dependent upon fruit alone that an article in this issue on the subject of "Hogs and Sheep in the Orchard" is well worth his attention.

The Apple Crop of 1916.—At the present time reports from all sections indicate that this year's crop will be the cleanest crop of apples produced for many years. Fungus is absolutely under control in the sections where it has been prevalent in the past. Growers have sprayed carefully and thoroughly for codling moth, and up to the present time no damage is reported. The greatest damage usually occurs in the month of August and September, but it is safe to say in advance that the work will be so carefully and thoroughly done this year that the loss from codling moth will be reduced to the minimum in almost all of the districts of the Northwest.

Inoculation for Cover Crops.—A number of growers who have sown clover and alfalfa in orchards and soils, particularly where clover and alfalfa had not been previously grown, have found that by inoculating the seed they can produce a splendid stand where otherwise failure would generally occur. Inoculation has been worked out scientifically by the Experiment Stations and bacteria are being prepared by a number of manufacturers in a commercial way for general use. Inoculation is a matter which every grower should investigate who expects to sow cover crops this fall or next spring.

International Apple Shippers' Association will hold their annual convention in New York City August 15, 16, 17 and 18, at the Astor Hotel. This convention is most important to apple growers of any convention that is held anywhere in the United States by any organization. It is an opportunity that no apple grower or, particularly, any apple salesman, should miss, if it is possible for him to attend.

Thinning Apples.—While the crop of apples is not heavy this year, it must be borne in mind that a perfect crop in size as well as cleanliness is a big factor in price. While the trees are not loaded, nevertheless it is a fact that intelligent thinning will be necessary this season. If it has not yet been done it should be done promptly.

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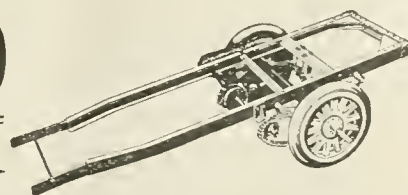
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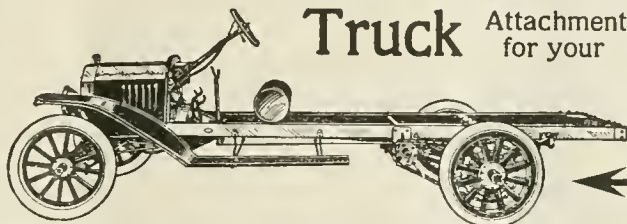
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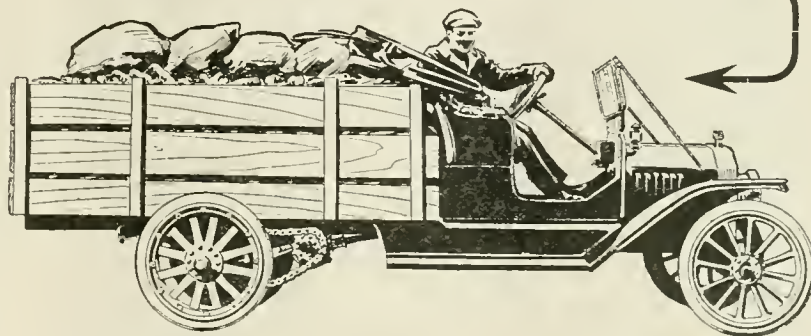
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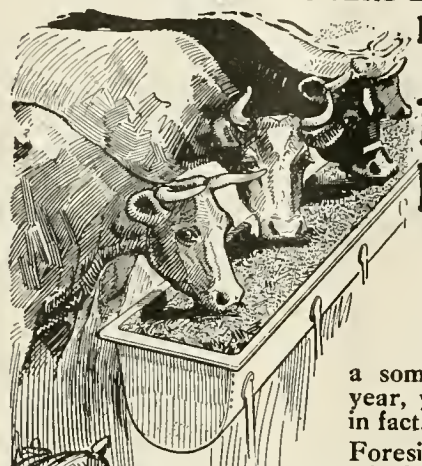
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GEO. C. OBER, Manager

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The beet sugar factories will soon begin the slicing of this season's beet crop—and that means a new supply of Larrowe's Dried Beet Pulp. While we will have a somewhat larger supply than last year, yet the demand is also larger—in fact, has increased enormously.

Foresighted dealers in nearly every district have already placed orders for shipment—but if you wish to make sure of getting what you require it will be well to see your dealer at once and give him an order for early delivery or state the amount you think you will need during the next few months.

Everything seems to favor the man who is prepared, so we say—"see your dealer now."



—is a succulent, milk-producing, vegetable feed that gives certain and profitable results. Combine it with alfalfa and it makes a wonder ration. It increases the milk flow from 1 to 5 lbs. per day from each cow, and in addition keeps your cattle healthy, sleek-coated and bright-eyed.

Larrowe's Dried Beet Pulp is light, bulky, succulent and easily digested; absorbs water very quickly and swells to about six times its original bulk; is cheaper than bran and other mill feeds, yet produces better results. It is put up in convenient 100-lb. sacks, and may be had either plain or with molasses. Ask for "Larrowe's."

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"Profitable Feeding" contains valuable information that should be in the hands of every feeder. Sent free on request.

THE LARROWE MILLING CO.

944 Central Building
LOS ANGELES, CALIFORNIA

to the center apple is that it is the first one of the cluster to blossom, and has several days' start of the others and will make the largest apple of the cluster. The large apples are the ones that usually mature first and command the top price, and that is what we are all looking for.

I would endeavor to have all the apples of red varieties on the upper side of the limb. Probably nine-tenths of the apples point upward at blossoming time, or while the apple is small, one cheek of the apple is toward the south and it will start to color while it is small; as the apple grows its own weight pulls it down so that the other cheek will be exposed to the sunlight. This insures high coloring and a large percentage of Extra Fancy apples. In no case leave an apple on the under side of the limb of red varieties.

As I have said before, it is difficult to lay down hard and fixed rules for thinning apples. We must use good common sense and thin according to the strength of the limb. With Jonathan and Winesap, in no case would I leave the apples closer than 8 to 10 inches apart. I would not leave an apple on new wood, that is, wood that grew last year. The blossoms on new

U. S. Gov. experts report that oils correctly refined from asphalt-base crude "distill without decomposition" (do not break up and lose their lubricating value under cylinder heat) and "are much better adapted to motor cylinders, as far as their carbon-forming proclivities are concerned, than are paraffine-base Pennsylvania oils."

Motorists who use Zerolene, an oil scientifically refined from asphalt-base crude, back up the experts with reports such as these: "Covered over 16,000 miles without adjusting valves or cleaning out carbon."—"The carbon taken out of this car in 50,000 miles amounted to less than an ounce." Zerolene is for sale at dealers everywhere and at service stations and agencies of the Standard Oil Company

ZEROLENE

the Standard Oil for Motor Cars

Thinning Apples

By F. G. Carlisle, Kettle Falls, Washington

WE have heard a great deal said about spraying, pruning, cultivating and fertilizing, but very little about thinning, which I consider the most important phase of orchard work. If we fail to thin and to do it intelligently, we cannot hope to make a success of growing fancy apples, all of the operation mentioned are so dependent on each other, that if we neglect either of them, we fall down on the whole proposition. If we hope to grow a high percentage of extra fancy fruit, it is absolutely necessary that we thin the fruit and thin it intelligently. One reason why we should thin our fruit is that in the Northwest, under

normal conditions, the trees will usually set more fruit than they have strength to grow to proper maturity, and if we do not thin the fruit will be small and inferior.

It is not an easy matter to say off-hand just how to thin, as each tree may require different treatment, or I may say each branch of the tree. However, I would say thin to the center apple of the cluster, cutting off all the apples on the side of the cluster, unless we find that the center apple has been injured by frost or in some other way. In that case we should select one of the apples of the side of the cluster, cutting off all the others. The reason for thinning

wood appear eight or ten days later than on the old wood, thus giving the fruit on the old wood an advantage from the start. It is on the last year's wood that you get the small, poorly colored and immatured apples. Never leave two apples so they will touch. The point of contact will prevent coloring and offers a harboring place for insects.

The trees should be gone over again in the middle of the summer, and all misshapen, limb-rubbed and marked apples should be taken off and allow the strength to go into the remaining apples on the tree. These apples are "C" grade at that time and will never be any higher grade. We will get more "C" grade apples than we should have anyhow. The Jonathan, Wagener and Winesap should be thinned as soon after the fruit sets as possible. The earlier that we can thin them the larger the fruit will be. I have done this for several years and never have had the June drop, unless they had been injured by late frost. However, with the Spitz and Rome Beauty I find this a useless expense, for I find that with me they will have the June drop anyway. I find that very few of us have sufficient nerve to thin enough.

I will never forget the advise of the venerable C. L. Smith, given at the first farm institute that I attended in this state, in which he said: "Thin until you think that you have enough off, then go over the trees again and take off one-half of the remainder." I have found this to be splendid advice, especially on older trees. Of course the older trees will require more severe thinning than young trees. If we thin early and thin severely we will grow larger fruit, and it will also have a tendency to make the trees bear a fair crop of fruit each year. I would also advise thinning as an aid to spraying in this district where the apple scab is one of the problems that we have to contend with. It is utterly impossible to coat the fruit with the spray if two apples touch each other. I hear a great many men complain of the expense of thinning. I would like to say that it does not cost as much to thin the excess off and let it drop to the ground in the spring as it would to pick it off in the fall and place it in a picking bag and then go to the expense of sorting them out.

From the best authority that we have, the production of apples in the Northwest is sure to increase very rapidly, and if we hope to reap the full measure of success we must grow a high percentage of Extra Fancy fruit. The low-grade fruit will not stand the freight and will injure the sale of the better grades. We are too far from the large centers of consumption to hope to market anything but the very best grades

Sebastopol Gravensteins

The crop of famous Sebastopol Gravenstein Apples is now moving. Season closes August 26th. The best apples from over 200 of our best orchards. Community packing houses insure uniform pack.

See our representative or wire us.

Sebastopol Apple Growers' Union

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Secretary of the Interior

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Let us help you plan a tour of the park, either direct or in connection with this season's Eastbound Low Fare Tours



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Position as foreman or superintendent on a fruit or general farm by young married man; agricultural college graduate; experienced on both fruit and dairy farms. Strictly temperate; good references.

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of fruit, and the sooner we realize this and stop growing inferior fruit the more profitable it will be to all. In order to compete with other sections growing the same varieties of fruit as are grown in this district, we must use every available means to get the size and color earlier in the season than we have been doing, and this can only be done by thinning early and severely and by summer pruning.

Fruit-Market Agency Will Improve Service

"The new fruit-marketing agency developed by the United States Department of Agriculture will give the Northwest fruitgrowers such a service for marketing their products as they have never had before," said Professor C. I. Lewis upon his return from a conference with Captain Paul Weyrauch, president of the Fruit Growers' Agency, Inc., C. T. More of the Office of Markets and Rural Organization of the United States Department of Agriculture, and G. A. Nahstal of the Federal Bureau with headquarters at North Yakima. Professor Lewis, representing the Oregon Agricultural College Extension Service, was called into conference with these marketing specialists to consider the best means of putting into effect the uniform contract marketing plan and to devise the best methods of physical handling so that the fruit products will meet the standardization requirements. The conference agreed to recommend activities by members of the fruit marketing agency along four distinct lines, as follows:

Securing and distributing accurate reports of crop conditions; securing a uniform system of harvesting; improve the storage and packing service, and secure standardization of account-sales system. "Heretofore," says Professor Lewis, "no exact or complete information has been obtainable of the amount and conditions of horticultural crops. Growers and distributors of the Northwest have been compelled to rely upon guesses for this information and consequently have made many mistakes. Other and larger agencies in other parts of the country have been able to get a good deal more complete and exact information than the local men, and they have capitalized the mistakes of the Northwest growers and handlers. It is hoped that we can now develop a system of collecting and reporting the exact conditions, thus giving us a tremendous advantage that we have not before enjoyed. The uniform harvesting system should supply large quantities of fruit of like kind and like degree of maturity. Too often in the past the fruit has dribbled in in small quantities, too small to attract the attention of large dealers, and it has been of varying degrees of maturity, some over-green, some just right and some overripe. These conditions must be improved if the best markets are to be accessible. This is a critical time for the horticultural industries of the Northwest and a great deal of the future success of the industry depends

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The Cost is Low Round Trip Tickets are on sale daily from all Southern Pacific stations in Western Oregon. The return limit is October 31.

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John M. Scott, General Passenger Agent, Portland, Oregon

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upon the present improvement of packing and storage service. The Fruit Growers' Agency will make a systematic study of the relative merits of the packs of the small individual growers and of the community packs. By community pack we mean the pack put up by a number of growers, three or more acting together. Packs put up in this way will of necessity be more nearly uniform than those put up by individuals acting independently. The system will permit a specialization in the division of labor or the employment of more expert assistants in the work of packing and will increase the rapidity of handling. Another big advantage of the co-operative plan is the economy. Now look here. Suppose five men invest two thousand dollars each in a packing house and packing equipment for handling their own individual fruit. Suppose five other men go together and erect one packing house and buy one set of equipment. The cost to the five growers under the former plan is \$10,000. To the five growers under the second plan it is \$2,000. Of course the larger growers may own their own individual warehouse and packing equipment, but it is a charge on the industries that the business of the small grower will not stand. The adoption of a uniform sales-account system will enable the investigator to see at a glance the condition of the business. Heretofore, the radically different systems of recording the account sales made it difficult, if not impossible, to arrive at an understanding of the condition. This information is necessary to the success of uniform marketing plans and it is hoped that the uniform account-sales plan will be accepted by a large majority of growers and distributors. A careful study will be made of the fruit from the time it leaves the tree until it reaches the consumer, and every effort will be made to fit properly to go into the best and most profitable market."

Zillah, Washington, has a cold-storage plant with a capacity of 600 cars.

Walla Walla, Washington, reports very little damage from the frost.

Nice Bright Western Pine **FRUIT BOXES** AND CRATES

Good standard grades. Well made. Quick shipments.
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FRANK MEREDITH, Secretary, North Yakima

The Prospects for Wormy Apples

[Experiment Station, Pullman, Washington]

THE season 1915 was generally considered a "worm year." Because of a concurrence of several factors more apples than usual were wormy at harvest and correspondingly more worms than usual went into winter quarters. Ordinarily the winter mortality of the codling moth is excessive, as is obviously apparent when we consider how few apples become wormy early in the season year after year. The past winter, however, although severe, did not manifest the alternate freezing and thawing which is most fatal to the codling moth. In many localities a snow blanket held over into spring to protect the worms in the ground. Accordingly the codling moth has been transforming in numbers, and in the warmer valleys the first brood of worms is showing up to a startling extent. First-brood worms should be destroyed by every means possible, declares Dr. A. L. Melander, Entomologist of the Washington Experiment Station. A codling moth produces forty some eggs and as in many districts a partial third generation exists which is at least as numerous as the second generation, every worm destroyed early in the season carries with it the destruction of dozens of others.

Owing to the habit of the majority of codling worms to enter the fruit through the calyx cavity the importance of proper calyx spraying immediately after blossoming cannot be overstated. This spraying is effective for the last worms of the season as well as for the first, but does not help much in destroying the minority of worms which seek to enter apples through the sides. The relatively few worms which have this habit must be reached by a series of cover sprayings, but because of a peculiar instinct of the newly-hatched worms cover sprays are never 100 per cent effective. When a worm bites into the apple skin it rejects, without swallowing, the tough epidermis. Only accidentally then does it swallow any poison, for its mouth becomes pretty well cleaned by the rejected bitings. Owing to this habit many worms can work through even the most complete of cover coatings. It seems, furthermore, practically impossible to coat every portion of every apple, so that many worms gain free entrance into the fruit. It is such escaping worms

which cause destruction by multiplying into a second and a third brood.

A cover spraying is considered effective for three or four weeks. If the first cover spraying was timed too early so that after weeks many worms are still entering the fruit, another application should be given, but if it was properly timed it is unnecessary to repeat this spraying. The exact strength of the spray is not so important as the time and the method of application. Five pounds of paste arsenate of lead to two hundred gallons will answer as well as double that quantity. The cover sprayings may be supplemented by banding, in which case the bands should be cleaned every two weeks. But by all means thin for wormy fruit, and destroy the picked-off fruit. If the potentialities of neglected first-brood worms were realized the rancher could well afford to give a premium for wormy fruit when thinning.

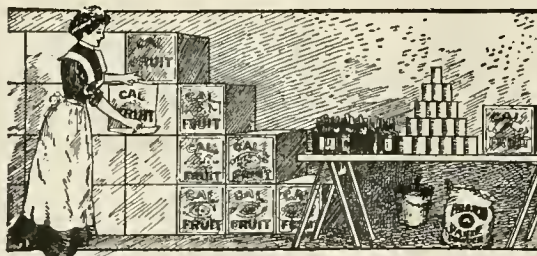
Except for a few abnormal precocious worms the onset of the first-brood worms this year dated June 5 at Kennewick, June 10 at North Yakima and June 15 at Wenatchee. For one month following these dates the first brood of worms is hatching, after which a lull of a couple of weeks can be expected before the beginning of the second brood. Preceding this lull it is useless to spray. The date for the second-brood spraying can be easily determined by trapping the earliest first-brood worms as they emerge from the fruit, as, for example, by a strip of burlap tied around the tree trunks. Allowing two weeks for the cocoon stage and two weeks more for the eggs to be produced and hatched and the date for the summer spraying is known. Summer spraying should be repeated at intervals of one month to provide for stretching of the fruit and rubbing off of the spray.

Colorado reported a temperature as low as 19 in some sections of the Grand Valley, causing severe losses. It is stated, however, that where growers smudged extensively that very satisfactory results were obtained.

The first box of cherries shipped by F. B. McKeivitt & Co., California, sold in Chicago for \$100.



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By-Laws Fruit Growers' Agency, Incorporated

(Continued from last issue.)

Article VII.—Meeting of the Membership

Sec. 1. The annual meeting of this corporation shall be held upon the second Monday of April in each year, in the City of Spokane, Washington.

Sec. 2. Special meetings of the members of the corporation may be called

by the President in his discretion, to be held at such time and place within the four Northwestern States, as he may name. Special meetings must be called by the President upon petition of not less than twenty-five (25) per cent of the membership of the corporation. The persons requesting a special meeting shall signify in their request the business which they desire to have considered at the proposed meeting. At least five days before holding of any regular or special meeting the Executive Secretary shall mail to each member of the corporation a written notice stating the time and place of holding the meeting, and giving proper notice of the business to be brought up at such meeting for action.

Sec. 3. Any member, in case of sickness or unavoidable absence, may, by written proxy, delegate to any active member authority to represent him or it at any meeting. The vote of such proxy shall be binding on the individual, firm or corporation he represents.

Sec. 4. A majority of the members represented in person or by proxy shall constitute a quorum at all meetings. In the transaction of business the majority vote of those present or represented by proxy shall decide, except as in these by-laws otherwise provided. Each member, whether an individual, partnership, association or corporation, shall have but one vote, regardless of the number of members, stockholders or officers of such partnership, association or corporation who may be present. Provided, however, that if called for, there shall be a tonnage vote, such tonnage vote to be based upon the actual tonnage handled by each member in the preceding year, it being further provided that only such tonnage shall be voted as may be involved in the issue to be voted upon. A tonnage vote shall be one vote for each car shipped by the member voting.

If at any meeting of the members it is found that a majority of the mem-

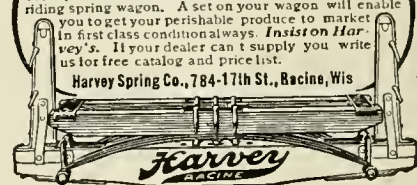
bers are not present or represented by proxy and that it further appears that the members present in person or by proxy actually represent a majority of the total tonnage of the active membership, then a quorum shall be declared.

Sec. 5. The regular order of business at the annual meeting of the members

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The New Patented Harvey Bolster Springs are made just like the finest automobile springs. They absorb all the bumps, jars and jerks of rough, uneven roads, and change an ordinary wagon into an easy-riding spring wagon. A set on your wagon will enable you to get your perishable produce to market in first class condition always. Insist on Harvey's. If your dealer can't supply you write us for free catalog and price list.

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From the Torture of Flies



In Sealed GALLON CANS \$1.25

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Applied in a few seconds at a cost of less than 1/2 cent per day per head.

If you milk more than one cow you need a "NATIONAL" Separator with the marvelous 1 piece skimming device, the "Vortispoon"—Catalog on request.

PORTLAND SEED COMPANY
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The simplest and most serviceable spray pump on the market. Use it in bucket, keg or barrel. **All Kinds of Spraying.** For whitewashing barns, coops, pens, etc. For washing windows, buggies and autos. Sells for half the price of similar pumps.

ANTI-SUCTION No packing to wear out; no friction; works easy; constant pressure; carry it to your work loaded; or insert in liquid container. Excellent for spraying trees and stock, and for all disinfecting purposes.

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of this corporation, and so far as feasible at special meetings, shall be as follows:

1. Reading and approval of minutes of the last meeting.
2. Reports of officers.
3. Reports of committees.
4. Unfinished business.
5. New business.
6. Adjournment.

Sec. 6. Roberts' Rules of Order shall be recognized as standard authority by this corporation in all cases not otherwise provided for.

Article VIII.—Meetings of Board of Trustees

Sec. 1. The annual meeting of the Board of Trustees shall be held immediately at the close of the annual meeting of the members in each and every year, at the place where the annual meeting of the members is held.

Sec. 2. Special meetings of the Board of Trustees may be held at any time or place in the four Northwestern States upon call of the President or on written application made to the Executive Secretary by any three members of the board. Five days' written, or two days' telegraphic notice of such meetings, shall be given by the Executive Secretary to all members of the board, and such notice shall give the time and place of meeting and the purpose or purposes for which it is called.

Sec. 3. At any such meetings the presence of a majority of the members of the board as at the time constituted, shall make a quorum, and the attendance of a quorum shall be necessary in order to transact business.

Sec. 4. The order of business at the annual meeting of the Board of Trustees, and so far as feasible at special meetings, shall be as follows:

1. Reading and approval of minutes of previous meeting.
2. Reports of officers.
3. Reports of committees.
4. (At annual meeting) Election of officers.
5. Unfinished business.
6. New business.
7. Adjournment.

Article IX.—Committees.

Sec. 1. The President shall, at or immediately following the annual meeting, appoint an advisory committee, an arbitration committee and a membership committee, and such other standing committees as he may deem advisable, subject to confirmation of the Board of Trustees.

Each of the above committees shall consist of not less than three members. The membership of any and all committees may be selected either from the trustees or from persons who are members, officers, trustees or employees of organizations holding membership in this corporation.

Article X.—Advisory Committee

An advisory committee of not less than three shall be appointed from among the active members, such appointment to be ratified by the Board of Trustees. The Secretary shall be an ex-officio member of this committee.

Ridley, Houlding & Co.

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1.—We Specialize in Apples

2.—All Consignments Receive our Personal Attention

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THROUGH the microscope, a spindle looks as rough as sand paper. That's where the rub comes. But the powdered mica in Mica Axle Grease fills up this unevenness, making a smoother, cooler bearing. That's why Mica does better work, and lasts twice as long. Get a can from your dealer today.

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Oregon Nursery Company

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Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate.

Write us about your wants before buying.



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PRUNING SHEAR

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RHODES MFG. CO.,

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THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.

TOP DRESS all your Crops with **Nitrate of Soda** alone, no matter what other fertilizers you may have used. 100 pounds to the acre for seeded, and 200 pounds to the acre for cultivated crops will do the work. The increase will yield large profits over the cost.

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TARRED ORCHARD YARN

The time is now just right for tying fruit trees. Tie the interior of the tree before the leaves are out and the exterior can be tied later. Orchard Yarn is put up in 5 lb. balls, 10 balls to a sack. This form is more convenient for use as the ball can be placed in the tree and by pulling the yarn from the inside it never tangles. 2-ply contains about 100 feet per pound.

Sold by all merchants handling orchard supplies
MANUFACTURED BY

The Portland Cordage Co.
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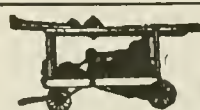
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Gearless Improved Standard
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Drills through any formation. Five years ahead of any in 9 hours. Another record where 70 feet was drilled on 21-2 gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.
REIERSON MACHINERY CO., Mfgs., 1295-97 Hood St., Portland, Ore.

The advisory committee shall act in an advisory capacity to the Executive Secretary. This committee shall have power to call special meetings of the trustees. The advisory committee shall be called together at such times as may be deemed necessary by the Executive Secretary.

Article XI.—Membership Committee

The membership committee shall pass upon the qualifications of applicants for membership and report the findings of the committee to the Board of Trustees, who shall act upon the same at the first meeting after the presentation of the report of the membership committee.

Article XII.—Arbitration Committee

Sec. 1. The President shall appoint, at or immediately following the annual meeting, a committee of three to serve during the ensuing year as a committee of arbitration.

Sec. 2. Upon their appointment, the arbitration committee shall meet and elect a chairman from their own body. The Executive Secretary of the corporation may act as secretary of the committee, but if for any cause he is unable or does not act, the committee may appoint a clerk pro tem.

Sec. 3. The arbitration committee shall have power to fix the time and place of investigations or hearings on matters submitted to them, and shall further have power to determine the manner of hearing complaints, and shall notify both complainant and defendant of the time and place of hearings at least ten (10) days in advance of the date of any such hearing. The committee shall have power to dismiss complaints or continue hearings thereon and to adjourn its sessions from time to time as it may see fit, the complaining party and the person, firm or corporation against whom the complaint is made shall be entitled to appear in person or by attorney at all hearings, and to introduce evidence in support of their contentions. After hearing the evidence introduced and the arguments presented by the parties the committee shall make such further and independent investigation as it may see fit, and shall render its decision when it shall reach a conclusion in regard to the merits of the controversy. The decision of a majority of the committee to be decisive of any question or complaint submitted to it, and to be binding upon the parties involved. The costs and expenses of arbitrations and investigations shall be assessed by the committee against the parties thereto in such manner as a majority of the committee shall determine.

Sec. 4. In case of any member of the arbitration committee being a party to any controversy in dispute he shall be ineligible to act and his place shall be filled by appointment by the President of the corporation.

Sec. 5. No person, firm or corporation shall be entitled to a hearing before the arbitration committee unless one or both of the parties to the dispute is a member of this corporation.

One Horse Is Enough

No need to lose dollars these days by incomplete tillage. If you have one horse—that is enough! You can do as good work as the big outfits on the largest farms, when you use one of the several types of light draft, 1-horse sizes of the

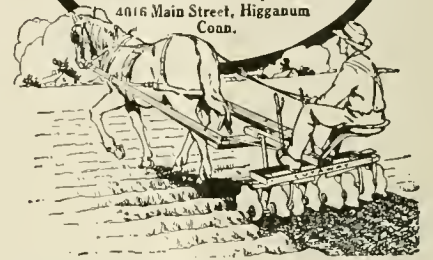
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(CLARK)

Disk Harrows

Disks, cutlery steel forged sharp; reversible gang; dust-proof, oil-soaked hardwood bearings are a few of its features. If your dealer has not the genuine CUTAWAY, write direct. Send for free book "The Soil and Its Tillage," and for special folder illustrating one-horse implements.

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Maker of the original CLARK
disk harrows and plows
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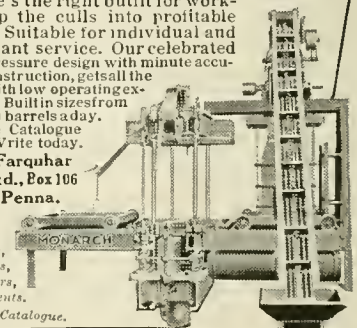
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Here's the right outfit for working up the culls into profitable cider. Suitable for individual and merchant service. Our celebrated high pressure design with minute accurate construction, gets all the juice with low operating expense. Built in sizes from 15 to 400 barrels a day. 60-page Catalogue free. Write today.
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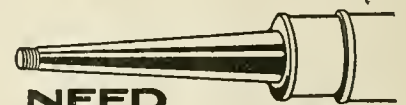
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YOUR AXLES



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Wheels may change, but C. & S. Axle Grease goes on forever. It's been the friend of the farmer for two generations.

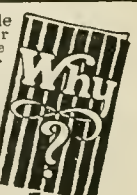
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WHITTIER-COBURN COMPANY
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The liveliest little Engine book ever published. Tells the principles of good engine construction so plain and so interesting that any man or boy will enjoy reading it. Write today.

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All persons or firms entitled to a hearing before the arbitration committee shall file with the Secretary their evidence and an agreement in writing to submit their case to the committee and be bound by their decision or award. On such agreement being signed the Secretary shall notify the parties to the controversy when a meeting of the committee will be held to hear and decide their case.

Sec. 6. Any statement of grievance between members of this corporation involving a charge against a member of questionable mercantile conduct, or conduct unbecoming a member, may be filed with the Executive Secretary and by him shall be referred to the arbitration committee for investigation. If the charge is sustained, the committee may recommend that the member so charged may be reprimanded, suspended or expelled. The arbitration committee shall make its recommendations to the Board of Trustees and said offending member shall be dealt with at the discretion of the Board as heretofore provided.

Sec. 7. Any statement of grievance against a member of this corporation, made by a party not a member, involving a written and specific charge of questionable mercantile conduct, may be filed with the Executive Secretary accompanied with an agreement by the complainant (non-member) to present evidence and testimony to the arbitration committee to sustain such charge, and further agreeing to abide by the findings of the arbitration committee, and to pay the expense of the investigation and arbitration if his complaint is not sustained. Such documents shall be referred by the Executive Secretary to the arbitration committee for investigation. If the charge is sustained, the member so charged may be reprimanded, suspended or expelled. The arbitration committee shall make its findings and recommendations to the Board of Trustees and said offending member shall be dealt with at the discretion of the board.

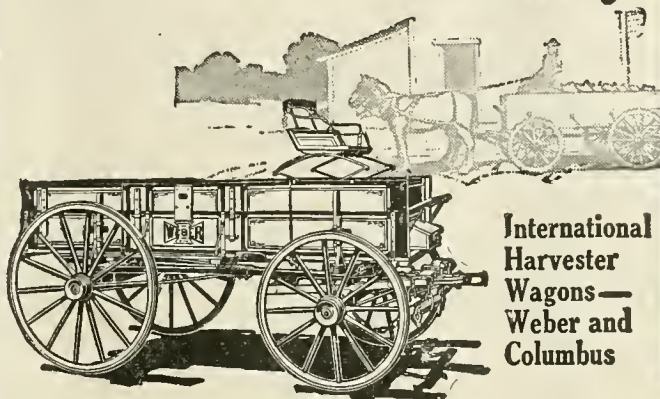
Sec. 8. Complaint of unfair methods or trade abuse may be preferred by any member of this corporation against any receiver, buyer, broker or commission man; such complaint must be made in writing and be filed with the Executive Secretary, who shall present it to the arbitration committee; such committee shall investigate said complaint, make findings thereon and report the same to the Board of Trustees and to the members of this corporation.

Article XIII.—Financing

Sec. 1. Budgets. All contemplated administrative and general expenditures for the fiscal year's operations which affect all the tonnage in the organization shall be made up in budget form by the Executive Secretary and presented to the members at their annual meeting for approval.

Sec. 2. Special Budgets. Special budgets must be prepared by the Executive Secretary to cover expenditures which affect special or unforeseen activities, and before becoming effective must

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Harvester
Wagons—
Weber and
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YOU can be sure of one thing when you buy a **Weber or Columbus** wagon—You get more service for your money. The good service they give is one of the strongest features of **Weber and Columbus** wagons. This service is the result of careful design and construction, such as is shown in the **International fifth wheel**.

Look between the front axle and bolster, where the king bolt goes through. There you will find the fifth wheel (an exclusive feature). Note the wide circular wearing surface of the two substantial fifth wheel plates. Those plates relieve the owner of a lot of trouble. They prevent breaking or bending of circle irons. They prevent the pitching of the bolster that breaks or bends king bolts. They take strain off the reach and keep the lower part of the front axle from sagging.

This one feature adds years to the life of the wagon, but, better even than that, it indicates the care and thought that have been given to every **Columbus** and **Weber** feature, and they are many.

Look over the **Weber** or **Columbus** wagon carefully, either at the local dealer's place or in the illustrated wagon folders we will send you on request. Then you will see why, if you want more for your money, your next wagon should be a **Weber** or **Columbus**.

International Harvester Company of America

(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
San Francisco, Cal. Spokane, Wash. Salt Lake City, Utah

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly.

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"BLUE RIBBON"

*Bartlett Pears
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Italian Prunes*

In straight or mixed cars.
All orders given careful and prompt attention.

Wire for Prices.

Yakima County Horticultural Union

**FRED EBERLE, Manager
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**lighter, flakier
biscuits**

Steady, evenly distributed heat, under perfect control makes a good oil stove wonderful for baking.

NEW PERFECTION OIL COOK-STOVE

*For Best
Results
Use
Pearl Oil*

A good oil stove is just like cooking with city gas. If you haven't a New Perfection you've missed comfort for years. Bakes, broils, roasts, toasts. More efficient than your wood or coal stove, and costs less to operate. Cuts out the coal-hod and wood-box drudgery. Keeps your kitchen cool. The long blue chimneys prevent smoke or odor. In 1, 2, 3 and 4-burner sizes, ovens separate. Also Cabinet Models with Fireless Cooking Ovens. Ask your dealer today

STANDARD OIL COMPANY
(California)



be submitted to the trustees and selling agents for approval. Special budgets must be prepared by the Executive Secretary to cover expenditures which affect special or unforeseen activities, and before becoming effective must be approved by the Board of Trustees and those members whom they would affect.

Sec. 3. Assessments. Each selling agent member shall be assessed for the general and administrative budget in proportion to the estimated tonnage as ascertained at the closing of the contract period, such assessments to be finally adjusted at the end of the season on a basis of the actual tonnage handled by the member. For special budgets each selling agent member shall be assessed in proportion to his tonnage participating in the activities as provided for in the budget, such assessments to be adjusted in the same way as those of the general and administrative budget.

Sec. 4. Payments on assessments shall be made into the treasury of the corporation at such times and in such manner as may be provided for by the Board of Trustees.

Sec. 5. Neither the Executive Secretary nor any other officer nor employee shall have authority to bind the corporation with any acts or contracts or make any expenditures other than those provided for in approved budgets.

Article XIV.—Corporate Seal

The corporate seal of the corporation shall bear the inscription, "The Fruit Growers' Agency, Incorporated—Corporate Seal."

Will Sell Cheap

OUR FINE

Apple and Peach Orchard

All Peach and part of Apples now in bearing. 6 years old, 180 acres. Poor health cause of selling. Write for prices and particulars.

CHAS. E. OUTCALT, Alexandria, Virginia

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Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of

Fruit and Ornamental Trees, Shrubs, Vines, Etc.

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The Paris Fair

HOOD RIVER'S LARGEST
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RETAILERS OF

EVERYTHING TO WEAR

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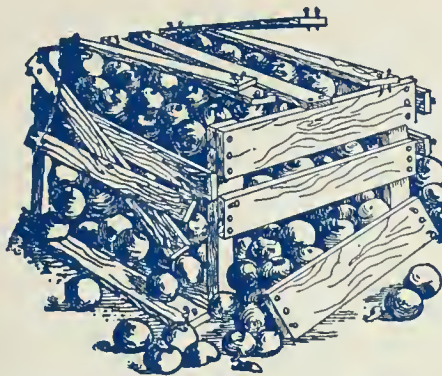
HAMILTON & BROWN AND
THE BROWN SHOES
HART, SCHAFFNER & MARX
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JOHN B. STETSON HATS

NEMO CORSETS

Strictly Cash—One Price to All



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

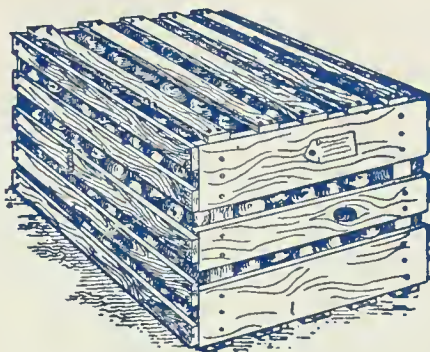
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
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AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

We have an attractive
Agents proposition.



**Buy Now for Your
Peach Packing
Use Later for Your
Apples**

A practical labor saving device for the progressive fruit grower. Increase the attractiveness of your package and you naturally increase your financial returns. Just think all the five stamps placed on the box at one operation and in a neat, uniform way. Always in line with a clear impression of the type. Nothing upside down or half printed. Stamps variety, grade, number, grower's name and address and net weight in **one second**. Inks itself each time for the next box. Can not get out of order. **Will work on any kind of press.** We have not the space to tell you of all its wonderful features. Write and we will be pleased to send literature. Price, prepaid, with necessary bands, stamps, etc., **\$8.00.**

Practical Box Marker Co.
Otis Orchards, Wash.

Marketing Your Crop!

The great problem facing the grower is the marketing of his crop. Be Up-To-Date and CAN it. This insures you against loss from glutted markets and makes your fruits imperishable. You can do this at home with your own help with an H. & A. Steam Pressure Canning Outfit, Family, Orchard or Commercial size. Our recipe book tells you how to can everything eatable that goes into cans with the outfit. Write for descriptive matter to the manufacturers.

Henninger & Ayes Mfg. Co.
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**United States Steel
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J.C. Pearson Co., Inc.
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PEARSON
ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.
ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.
RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.
SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.
ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime *you* play safe.
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LESLIE BUTLER, President
TRUMAN BUTLER, Vice President
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Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital \$100,000.00

4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

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STEINHARDT & KELLY NEW YORK

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MOST IMPORTANT FACTOR
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THE COUNTRY'S FANCY
APPLES
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OUR MARKET—
THE WORLD

BETTER FRUIT

VOLUME XI

SEPTEMBER, 1916

NUMBER 3



Courtesy of Pearson-Ryan Company.

The Northwest is not only famous for its wonderful apples, strawberries and pears, but also for peaches, grapes, plums, prunes and other varieties of fruits.

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

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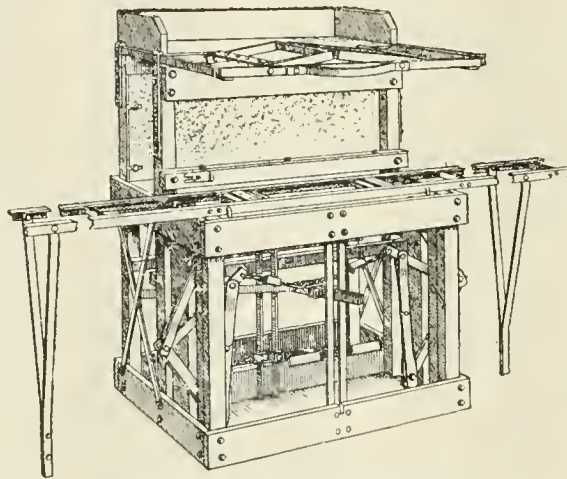
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Price \$1.50 each

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Portland Picking Bag
Price \$1.50 each
Per doz. \$15.00

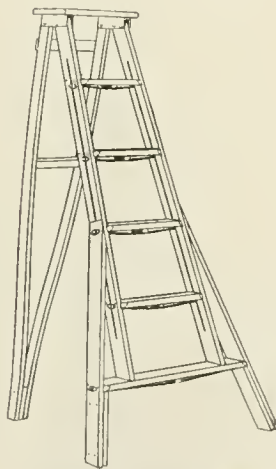
In the Northwestern Lid Press we offer you the maximum of speed in pressing and nailing up fruit boxes. The handling of the lids, placing same on the box and lining them up ready for pressing is automatic. It is provided with a reservoir holding 75 lids and a track on which the boxes come to the nailer. The time consumed in pressing is great-



Northwestern Lid Press

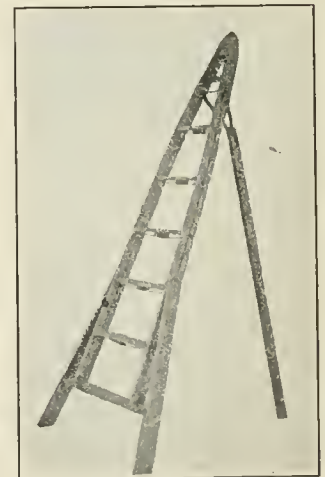
ly reduced and the finished product bettered.

Price, with stripper and Track,
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Hardie Orchard Ladder
Stock lengths
6, 8, 10, 12 and 14 ft.
Price per ft. 35c

We here show two types of orchard ladders. Both are constructed of clear, well-seasoned spruce; thus possessing great strength while yet light in weight. They are both of well-chosen design; built to give you service and safety to the picker.



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Our complete catalog of orchard and packing house supplies should be in your hands. A postcard request will bring it.

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49 North Front Street, PORTLAND, OREGON

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Farm Loan Act—U.S. Department of Agriculture

Provides System for Lending Money on Farm Lands at Reasonable Interest for
Relatively Long Periods—Amortization Plan for Easy Repayment Prescribed

THE Federal Farm Loan Act, popularly called the "Rural Credits Law," was signed by the President and became a law on July 17, 1916. The primary purpose of this act is to promote agricultural prosperity by enabling farmers to borrow money on farm-mortgage security at a reasonable rate of interest and for relatively long periods of time. To attain this object, two farm-mortgage systems are provided: (1) A system operating through regional land banks, and (2) a system operating through joint-stock land banks. To attract money to the farm-loan field, the act provides a method whereby those who have money to lend can find safe investments in the form of debentures or bonds, of small and large denominations, issued by the banks and based on the security of mortgages on farm lands. These two systems are to be under the general supervision of a Federal Farm Loan Board in the Treasury Department, composed of the Secretary of the Treasury, as chairman ex officio, and four members appointed by the President. This board has authority to appoint appraisers, examiners and registrars, who will be public officials.

The Federal Land-Bank System

Under the Federal land-bank system the act provides for Federal land banks which make loans, for the first twelve months, exclusively through local national farm-loan associations composed of borrowers. These associations shall be shareholders in the banks and in that way the members, who are borrowers, will share in the profits of the bank. The money for the loans is to come partly from the capital of the banks and partly from the sale by the banks of bonds secured by first mortgages on farm lands. The act defines strictly the purposes for, and the conditions under, which loans are to be made, and requires that the rate of interest charged on farm loans shall not exceed 6 per cent per annum.

Twelve Federal Land Banks

The United States shall be divided into twelve farm-loan districts, and a Federal land bank with a subscribed capital stock of not less than \$750,000, each share \$5, shall be established in each district. Each Federal land bank may establish branches in its districts. Within thirty days after the capital stock is offered for sale it may be purchased at par by anyone. Thereafter,

the stock remaining unsold shall be bought by the Secretary of the Treasury for the United States. It is provided, however, that the Government shall not receive any dividends on its stock. Ultimately, it is intended that all the stock in the banks shall be owned by the associations of borrowers, and provision therefore is made in the law for transferring the original stock at par to these associations.

Outline of Farm Loan Act

The Act provides for the creation of twelve Federal Land Banks and permits the establishment of any number of joint-stock land banks for the purpose of making loans at a reasonable rate of interest, for long periods of time, on farm lands.

A Federal Farm Loan Board has complete control over these banks.

(A) FEDERAL LAND BANKS.

Twelve Federal Land Banks are provided, one in each of twelve districts into which the country will be divided. These banks are empowered to lend on first mortgages on farm lands in amounts of \$100 to \$10,000 for approved purposes. The loans are to be made through farm loan associations and agents. No loan may be made for more than 50 per cent of the value of the land mortgaged and 20 per cent of the value of the permanent insured improvements upon it.

National Farm Loan Associations—local organizations composed exclusively of borrowers—are authorized. These associations must be stockholders in the land banks in proportion to the amount their members wish to borrow. Eventually all stock in the Federal Land Banks will be owned exclusively by these associations.

A reasonable interest rate is established. The Act prohibits the Federal Land Banks from charging more than 6 per cent on any mortgage, or requiring fees not approved by the Farm Loan Board.

The borrowers will share in the net profits of the bank because they are stockholders. It is contemplated that ultimately the borrowers will be the only stockholders.

Long term loans are provided by authorizing mortgages for periods of from five up to forty years.

Small annual or semi-annual payments on the principal are made a required feature of all mortgages.

(B) JOINT-STOCK LAND BANKS.

Joint-stock land banks are authorized. They are corporations for carrying on the business of lending on farm mortgage security and issuing farm loan bonds. They are to be under the supervision of the Farm Loan Board, but the Government will not invest in them. Subject to geographical limitations and subject to the 50 per cent and 20 per cent limitation, these banks can lend to an individual any amount they wish, and for any purpose. They cannot charge an interest rate exceeding 6 per cent and such rate must not exceed by more than 1 per cent the interest they have paid on their last issue of bonds. Their mortgages, however, must provide for amortization payments. These banks are prohibited from charging, under any pretext, fees or commissions other than those authorized by the Act.

National Farm Loan Associations

The act provides for the creation of local national farm-loan associations through which it is contemplated that the Federal land banks shall make their loans. In the event that a local loan association is not formed in any locality within a year, the Federal Farm Loan Board may authorize a Federal land bank to make loans on farm land through approved agents. Ten or more persons who own and cultivate farm land qualified as security for a mortgage loan under the act, or who are about to own and cultivate such land, may form such an association, provided the aggregate of the loans desired by the membership is not less than \$20,000. Each member must take stock in his association to an amount equivalent to 5 per cent of the amount he wishes to borrow. This stock the association holds in trust as security for the member's individual loan. The association, in turn, when applying for money from the bank, must subscribe for stock in the bank to an amount equivalent to 5 per cent of the sum it wants to obtain for its members. This stock is held in trust by the bank as security for the loans it makes through the association. If a prospective borrower has no money with which to pay for his association stock, he may borrow the price of that stock as a part of the loan on his farm land. Under this plan, then, every borrower must be a stockholder in his local association, and every association a stockholder in its district bank. Each stockholder in an association is liable for the acts of that association up to twice the amount of his stock.

How Loans Are Obtained

A member of a national farm-loan association, before obtaining a loan, must first fill out an application blank supplied to the loan association by the Federal Farm Loan Board. This application blank and other necessary papers will then be referred to a loan committee of the association which must appraise the property offered as security. Such application as is approved by the loan committee is then forwarded to the Federal land bank and must be investigated and reported on by a salaried appraiser of the bank before the loan is granted. This appraiser is required to investigate the solvency and character of the prospective borrower as well as the value of his land. When a loan is granted the

amount is forwarded to the borrower through the loan association.

Conditions Under Which Loans May Be Obtained From Federal Land Banks

The act specifically defines the purposes for which loans may be obtained. These are: (a) To provide for the purchase of farm land for agricultural uses. (b) To provide for the purchase of equipment, fertilizers and live stock necessary for the proper and reasonable operation of the mortgaged farm; the term 'equipment' to be defined by the Federal Farm Loan Board. (c) To provide buildings and for the improvement of farm lands; the term 'improvement' to be defined by the Federal Farm Loan Board. (d) To liquidate indebtedness of the owner of the land mortgaged, existing at the time of the organization of the first national farm-loan association established in or for the county in which the land mortgaged is situated, or indebtedness subsequently incurred for one of the purposes mentioned in this section."

Loans may be made only on first mortgages on farm land. Only those who own and cultivate farm lands or are about to own and cultivate such land are entitled to borrow. No one can borrow save for the purposes stated in the act and those who after borrowing do not use the money for the purposes specified in the mortgage are liable to have their loans reduced or recalled. The secretary-treasurer of each association is required to report any diversion of borrowed money from the purposes stated in the mortgages. No individual can borrow more than \$10,000 or less than \$100. No loan may be made for more than 50 per cent of the value of the land mortgaged and 20 per cent of the value of the permanent insured improvements upon it. The loan must run for not less than five and not more than forty years. Every mortgage must provide for the

repayment of the loan under an amortization plan by means of a fixed number of annual or semi-annual installments sufficient to meet all interest and pay off the debt by the end of the term of the loan. The installments required will be those published in amortization tables to be prepared by the Farm Loan Board. The bank is given power to protect itself in case of default by recalling the loan in whole or in part or taking other necessary action.

The Interest Rate Paid by the Borrower

No Federal land bank is permitted to charge more than 6 per cent per annum on its farm-mortgage loans, and in no case shall the interest charged on farm mortgages exceed by more than one per cent the rate paid on the last issue of bonds. For example, if the bank pays only 4 per cent on an issue of bonds, it cannot charge more than 5 per cent for the next farm loans it makes. Out of this margin of not to exceed 1 per cent, together with such amounts as it can earn on its paid-in cash capital, the bank must set aside certain reserves and meet all its expenses. Any balance or net profits can be distributed as dividends to the loan associations or other stockholders. The loan associations, from their bank dividends, after setting aside the required reserves and meeting expenses, can declare association dividends to their members. In this way the profits, if any, will be distributed among the borrowers and will, to that extent, reduce the amount of interest actually paid by them.

Restriction on Fees and Commissions

The Federal land banks are specifically prohibited from charging in connection with making a loan any fees or commissions which are not authorized by the Farm Loan Board. The authorized fees need not be paid in advance but may be made part of the loan.

Continued in next issue

All About An Apple

By Dr. Benjafield, Hobart, Tasmania

AS both food and medicine an apple is a wonderful example. Professor McAlpine gives us this digram, of which the following is an explanation in pure English: Suppose this apple to be the size of a large breakfast cup and into this cup you put nearly half a pint of water and stir into it: of concentrated food like that contained in an egg, half a teaspoonful; of fatty stuff like butter, a little less than half a teaspoonful; of sugar, both cane and grape sugar, two tablespoonfuls; of mineral matter, as much as will lie on a sixpence; of acids, a little more than half a teaspoonful; of skin and core, a little more than two-thirds of a teaspoonful.

From a medical point of view we look upon each of these elements as follows: The food or protein is pure and strengthening and exists in the apple combined with sugars and acids, and when taken it enters rapidly into the muscles, where it is readily broken

up, imparting heat and strength, so that the athlete, under great exertion, soon gets the stimulus.

The fatty matters are so beautifully combined with acids that even the most delicate child does not recognize that he is taking fat when he is eating an apple.

The sugars or carbohydrates form the most attractive element, as they are the most nourishing part of the fruit. And these sugars are just crystallized sunshine and are far more digestible than any ordinary sugar. The child, from babyhood, just loves it and it is excellent food for him. In the adult, especially in advanced age, ordinary chemically-prepared sugar when taken freely produces rheumatism, gout and such like diseases, but these sugars never set up any of these troubles; indeed gouty people get relief from eating fruit.

The mineral matter in the apple is one of nature's wonders. The blood must keep its red color or it cannot do its work in the body and we die, and this red color depends on the presence of iron. When we eat an apple we eat just the right dose of iron which the blood needs, and the invalid with poor blood will get iron in the apple which is far more easily absorbed by the blood than in any preparation of iron compounded by the chemist.

Lime is found in the apple in the same form as it is found in our bones, and in the apple the lime is so beautifully combined with phosphoric acid that, when an apple is eaten, the bones of the body are nourished by these lime salts, and by these additions of lime the child is able to build up the young growing bone. Ricketty children have bones deficient in lime. I have never seen Rickets or soft bones in a Tasmanian orchard.

Magnesia.—Yes, nature has placed in the apple quite a nice little dose of magnesia and it helps to keep off rheumatism by purifying the blood and assisting the bowels.

Phosphorus.—Professor Schaffer told us recently in the great scientific lecture of the year that life could not exist without phosphorus, and in the apple this great nerve tonic exists in quite a full dose and it exists in its most soluble form as phosphoric acid.

Sulphur, as sulphuric acid is also a great blood purifier and has an especial effect on the skin and skin diseases.

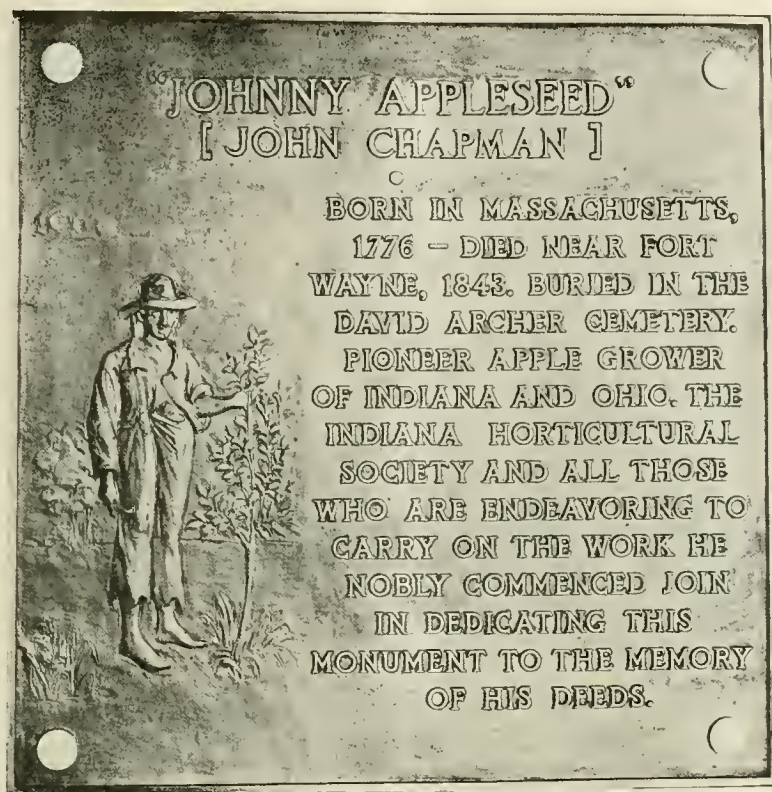
There is just one more thing which science has not yet explained, and that is the wonderful life processes by which all these tasteless (some even nasty) elements were blended together into a beautiful fruit and perfect food.

The sailor who lives a long time on salt meat and biscuit alone will rot with scurvy, and if he takes the sugars, acids, etc., contained in an apple every day separately he will still die, but if he takes an apple a day his blood will keep perfectly right. This shows there is life in the apple apart from just its chemical composition.

The bee loves honey because its nature cries for a perfect food, and for the same reason the child cries for an apple. Its digestion is assisted by it, the blood is made richer, the muscles are made stronger, the bones are made harder and the dose of phosphorus stimulates the nerves and feeds them until it wants to run and romp in exuberant life. Ask our men in the trenches what they would give for a good feed of apples.

The Manson fruitgrowers, in the Wenatchee district, have formed a local organization to affiliate with the Wenatchee North Central Washington Growers' League.

Dead limbs take a great deal of water from growing apple trees. They are in the way at gathering time and make the whole crop look diseased. If caused by canker, the disease will spread to other parts of the orchard. Prune them out now and paint the wounds.



Memorial Inscription on the Monument erected to John C. Chapman, otherwise known as Johnny Applesseed, at Fort Wayne, Indiana.

Memorial Inscription on Monument

On the 5th of May, 1916, in the city of Fort Wayne, Indiana, the Indiana Horticultural Society, in co-operation with the John Chapman Memorial Association of Ohio, unveiled a monument to the memory of John Chapman, universally known as Johnny Applesseed, with an inscription of which a cut appears above. John Chapman was born in 1776 in Massachusetts. He was a pioneer apple grower in Indiana and Ohio. With a great love for the fruit industry, he traveled through all the frontier regions of these two states, always carrying with him apple seeds, which he planted or gave away to settlers, doing this continuously for a period of over forty years. And perhaps it is due to him more than any one man the credit for the thousands of orchards throughout the Middle West, which have continued to be a comfort and a profit to the owners and inhabitants.

History records he was not only a remarkable man, but a man of eccentricities in many ways. He wore very little clothing, frequently trading apple trees for cast-off garments, continually traveling through the forests giving away apple seeds, planting apple seeds or selling apple trees. Frequently he would have no other coat than a coffee sack with armholes cut through. It is stated he went barefooted most of the time, even in winter. A strict vegetarian, eating no meat or fish; he believed it was wrong to take life in order to procure food. This probably

accounted for his zest and zeal for encouraging people to plant and grow fruit. He believed in outdoor life, rarely sleeping in the shelter of a house, and when he did he slept on the floor.

John Chapman certainly was an eccentric and peculiar individual, deemed by some to be somewhat unbalanced, but he was more than a planter and a distributor of apple seeds, for he loved his fellowmen and it was his greatest pleasure in life to do anything in helping his fellowmen, confining his work largely to horticultural service and instruction. Along with this he was religiously inclined, always preaching Christianity, carrying with him pages of his Swedenborgian Bible, from which he would frequently take out a leaf and pin on the wall in some house where he had stopped possibly for a meal or overnight. His religion was a religion of love, his favorite texts being, "Love thy neighbor as thyself," "Blessed are the pure in heart," and "How beauteous are Thy works, O God."

This short account is sufficient to show there was something peculiarly touching and compelling in his life and habits. It indicates he was a man of very unassuming character, whose great work was a work of love, doing the things he thought would do the most good, unmindful of fame or glory. So we agree with those who have said "God bless John Chapman."

Ninth National Apple Show at Spokane, Nov. 20-25

COMPREHENSIVE plans already are under way for the Ninth National Apple Show, which will be held at Spokane, November 20 to 25. Allen Meisenheimer, a well-known Spokane man who is interested in the apple industry, is chairman of the board of trustees, and, with Manager Gordon C. Corbaley, will direct the show.

A big innovation at this year's show will be a special contest to select the best five boxes of apples in the world. This will be open to any grower, and will determine which district and which grower can produce the most perfect five boxes of apples. This competition will follow the general lines of the world's competition at the Panama-Pacific International Exposition at San Francisco last year, which was won by Fred Conklin of Brewster, Washington, with Winesaps. A prize of \$250 in gold and a National Apple Show world's championship banner will be given the winner of this contest. The competition will be restricted to the following varieties: Arkansas Black, Delicious, Jonathan, MacIntosh Red, Rome Beauty, Spitzenberg, Stayman Winesap, Wagener, Winesap, Winter Banana, White Winter Pearmain and Yellow Newtown.

The grade and pack demonstrations, which were a big feature at last year's show, again will be held for the purpose of aiding to secure standard grade and pack. The leading shippers and associations in each district are being invited to prepare displays that will perfectly illustrate the range of fruit that they understand should be permitted within the limits of each grade and pack. These displays will be placed in immediate proximity to each other at the National Apple Show so that comparisons may be made with the fruit. Especially is this important because of the practical demonstration that it will give to the growers themselves. At certain hours each day the displays will be discussed in detail and the growers' questions answered.

In the five-box classes, 23 varieties will compete, and first, second and third prizes of \$25, \$12.50 and \$10, respectively, will be given the winners among each variety. The lots in this class are: Arkansas Black, Baldwin, Ben Davis, Black Ben, Delicious, Grimes Golden, Jonathan, King David, MacIntosh Red, Mammoth Black Twig, Missouri Pippin, Orley, Rainier, Red Cheek Pippin, Rhode Island Greening, Rome Beauty, Spitzenberg, Stayman Winesap, Wagener, Winesap, Winter Banana, White Winter Pearmain and Yellow Newtown.

The one-box contests again will be a feature. First, second and third prizes of \$7.50, \$5 and \$2.50, respectively, will be given the winners among 24 different varieties. A \$10 prize is offered for the best single-box display of a variety not previously shown at a National Apple Show and scoring 90 or better.

The National Apple Show offers a trophy cup and cash prize of \$25 to the

team from any agricultural college which attains the highest rank in the apple-judging contest. The cup shall be awarded for one year only, provided that if the team from any college shall win it three times in succession it shall become the permanent property of such school. Each team will consist of three students.

The exhibits of pruning, spraying, picking, packing and other equipment will form one of the great features of the show. As the apple growers are making progress along scientific lines, they are becoming more and more interested in doing their work in the best and most modern manner. The machinery and other industrial exhibits of last year's National Apple Show were seen by thousands of growers and in many ways attracted the greatest attention of anything at the show. These exhibits this year will be larger and more complete and more interesting. Every sort of machinery or equipment that belongs in the orchard will be at the show under demonstration.

Again this year there will be a contest between the leading apple shippers of the Northwest to determine which can make the best and most striking advertising display of the brand of extra fancy apples that it is offering on the market. Each entry must contain 100 boxes of one variety of apples, strictly standard extra fancy pack, put out by one shipper under one trademark brand. The exhibit may be arranged and decorated by the shipper in any manner desired. The prizes offered are: First, \$100 and gold medal banner; second, \$50 and silver medal banner.

The original and attractive feature displays will be open to individuals, firms and fruit and commercial organizations. The judges are instructed not to take into consideration the elements of cost and size, but the unique and artistic showing only. Prizes offered are: First, \$150; second, \$100; third, \$50; fourth, \$25.

A grade and pack demonstration to show the way that the rules are interpreted in each district also will be held. The orchard accounting competition, which has been an educational feature at past Spokane shows will be continued, as will the demonstration of improved appliances and the world's championship packers' contest.

Greater space is being provided for the women's department, where housewives will display home-made by-products of the apple and every dish in which apples are used.

In a recent issue of "Better Fruit," through a stenographer's error, it was stated the Canadian Pacific Railway had purchased \$10,000,000 worth of fruit in 1915. We are advised by Mr. W. E. McTaggart, Fruit Market Commissioner for the Province of British Columbia, that this is an error, and the amount should be \$10,000.



Joseph Steinhardt, of the firm of Steinhardt & Kelly, New York City, Chairman of the Entertainment Committee of the International Apple Shippers' Convention.

Mr. Steinhardt was chairman of the entertainment committee of the convention of the International Apple Shippers' Association, held at Niagara Falls August 16 to 18, which is a big factor in explaining just why everybody had such a splendid time at the convention.

It is a pleasure to add a few words about Mr. Steinhardt, for two reasons: First, on account of his wonderful achievement in the fruit industry, and second, on account of his great popularity. A few years ago Mr. Steinhardt and his popular partner, Mr. Richard Kelly, deceased, were doing a small competitive business in selling fruit in a very limited retail way. It occurred to both of them they could work better co-operatively than they could competitively, consequently they formed a partnership, doing a small retail business. Both men were self-made and self-educated. They were industrious, thrifty, of good habits, attending closely to business, believing in a square deal, liberal treatment and courteous business methods. Consequently their small retail business rapidly grew to a large retail business. Their success was so rapid they soon engaged in jobbing business. This in its turn grew, and grew so fast that within the last few years Steinhardt & Kelly have been numbered among the very large operators of fruits in the United States. In 1908 Steinhardt & Kelly made their first venture in Northwestern box apples, Mr. Steinhardt personally coming to the Northwest, purchasing practically the entire crop of Spitzenburgs and Newtowns grown in Hood River Valley, at prices which helped make the valley famous. Since then the firm of Steinhardt & Kelly have been heavy buyers of Hood River apples, and as business continued growing, the quantity of apples they purchased from the Northwest became more general and far greater in volume. Today they are

known as one of the heaviest handlers in New York City of Northwestern box apples. In addition to this their business covers all other varieties of fruits, both citrus and deciduous. But perhaps more important in a way than the big business they have done is the personality of Mr. Steinhardt. There is no man in the apple business who is willing to pay the price more cheerfully, more voluntarily than Mr. Steinhardt, when he can see his way clear to make a fair margin of profit. No man ever had a car rejected by Steinhardt & Kelly because the market was off or on account of any slight deficiency. It is a fact they have taken many cars of fruit far below the standard without a murmur. In addition to this Mr. Steinhardt is a big man. He is not only big in physique, but big in generosity, kindness and hospitality.

Wanted

Position as working foreman on fruit ranch. Nine years' experience in the Northwest; understand fruit growing. Pruning, grafting and blasting a specialty. Willing to do general farm work in connection (milking, etc.). Single, 34 years of age, of good habits. Best of references. Address

John M. Den Boer, Box 158, Fruitland, Idaho

Wanted

Management of an orchard. Several years' experience in all the best fruit districts of the Northwest. Best of references. M. R., care "Better Fruit."



YOU CAN EARN \$50.00 PER DAY
WITH THE
Gearless Improved Standard Well Drilling Machine

Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2½ gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.

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Trees in BLASTED soil bear better

Fruit growers have proved—by planting some trees in blasted beds and others in ordinary ground—that trees planted after the use of explosives root deeper, grow faster and better—that they are thriftier in every way, bear earlier, and yield larger crops.

They have proved also that when the soil of established orchards is properly blasted the trees immediately take on new vigor and bear better fruit thereafter. Orchardists know that this condition is due to the increased moisture-storage capacity induced by blasting and to the consequent release of plant food from the subsoil.

Fruit growers in every Pacific Coast State have used tons of

GIANT FARM POWDERS

STUMPING — AGRICULTURAL

Fruit Growers Say:

"My orchard has made excellent growth, due to the fact that I used dynamite, breaking up the soil and making excellent beds for the roots. If I were to set another orchard I would not think of doing so without blasting each tree hole."

T. A. JOHNSON,
Boise, Idaho.

"Generally speaking, the growth of plants depends upon the condition of the soil into which the roots penetrate. If the depth of loose soil is too limited or the surface water is permitted to stand too long, the growth is impaired. Explosives properly used have invariably resulted in excellent growth. The yield is often three times as great on blasted soil as from those untreated in the same vicinity."

ROSECROFT FRUIT FARM,
Summer, Wash.

"We consider the use of explosives an important factor in planting orchards. It is important to secure good drainage and the roots should be able to penetrate deeply into the subsoil. Young fruit trees newly planted should make at least one foot of new growth the first year, and this is hardly possible unless the land is put into good mechanical condition, with plenty of room for the roots to spread in the loosened subsoil."

A. LINGHAM,
Puyallup, Wash.

"Giant explosives are of great benefit for blasting beds for orchard planting. The difference in growth between unblasted trees and trees in blasted ground is so much in favor of the latter that no adequate comparison can be made."

DONALD NURSERY CO.,
Donald, Ore.

for planting trees and deep tilling their orchards. These powders are made in two brands, Eureka Stumping Powder and Giant Stumping Powder, and are prepared especially for farm and orchard work. They are more effective and do their work more economically than ordinary dynamites.

Eureka Stumping Powder pulverizes the soil instead of caking and packing or throwing it high in the air. This is the action that is wanted in stump and soil work, and the action that the so-called "high strength" dynamites will not give. When you use Eureka Stumping Powder the finished job costs you less money.

Giant Stumping Powder, which is also used for subsoil blasting, is the most efficient explosive for many other kinds of farm work, including blasting dead trees or stumps in wet soil.

Make this test of Giant Powders

By using the Giant Farm Powders you can demonstrate their superiority for tree planting and orchard tillage. Mail today a trial order with your book coupon. We will have our nearest distributor supply you—at lowest market price—with a 25- or 50-pound case of either of the Giant Farm Powders. Test this in comparison with any dynamite. The results will show you why fruit growers in every section insist upon having the Giant Farm Powders for orchard tillage work.

Giant Farm Powders and other Giant blasting supplies are sold by distributors everywhere. Your own dealer has them or can get them for you. If he offers you a substitute, write us and we will see that you are supplied with the genuine. Giant Powder is the trade name of explosives manufactured by The Giant Powder Co., Con. Because Giant Powders are best known everywhere, many have assumed that all high explosives are Giant Powders. Insist upon having the genuine.

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- ☐ TREE PLANTING
- ☐ DITCH BLASTING

Name _____

Address _____

Write below your dealer's name

Timely Advice on Marketing the Apple Crop

[From Office of Markets, U. S. Department of Agriculture]

ATTENTION is called to the small quantity of American apples—less than 2,000,000 barrels—taken by Europe in normal times. Both the growers and dealers are urged to view the situation with optimism and to prepare for the disposal of Europe's usual portion in other ways. It is suggested that with judicious handling the demand at home may be increased and the commercial crop marketed with relatively fair success to all. As to just what constitutes judicious handling, the Office of Markets makes the following suggestions:

1. Growers should pick the fruit in uniform condition, gleaning the trees only for what is ready to come off, repeating the process until the crop is harvested. The advantage is to secure a longer time for distribution and to prevent the pack from representing extreme stages of maturity ranging from ripe to green.

2. When picked the fruit should be handled from orchard to cars in such a way as to prevent deterioration, care being exercised to protect the apples from the elements. It is explained that under proper conditions fruit which is picked today should not be packed until tomorrow, and that for this purpose shelter should be provided.

3. Those using the barrel package should uniformly grade and pack the crop in compliance with the Sulzer law and brand in accordance with its provisions, for the purpose of creating a feeling of confidence among dealers and consumers.

4. Inferior grades should be eliminated from the green-fruit markets, not only for the reason that the demand for such grades will be very limited, but also because their presence in the markets will undoubtedly hamper profitable disposition of the better fruit.

5. All apple growers, operators, dealers and associations should early arrive at an estimate of true values in order to secure quick movement. It is explained that if arbitrarily high prices rule in the beginning of the season, the crop will not pass readily into consumption, but that on the other hand abnormal accumulation and congestion will occur throughout the channels of trade, with disastrous results to all concerned.

6. Only standard varieties well packed should be placed in cold storage for the reason that prices

likely to rule in the late fall and early winter, as the inevitable result of liberal offerings of common storage stock, will probably limit the demand for cold-storage apples until mid-winter.

7. An effort should be made to fully supply small towns by direct sales in order to secure a more uniform distribution and avoid congesting the large markets. Attention is called to the practice in some sections of growers who go with cars of apples to poorly-supplied towns and sell on the track. Growers or dealers who desire to use this system should apply to the town and railway authorities for information as to regulations controlling such sales, and, if conditions justify shipping, the arrival of the car should be preceded by judicious advertising.

8. Growers who live in communities where co-operative organizations are operated should do all possible to strengthen these exchanges. It is asserted that the disloyalty of members is the chief element of failure in co-operative enterprises, and growers are strongly urged to support their association as the best way to effect satisfactory distribution.

Those who grade, pack and brand their barrels in accordance with provisions of the Sulzer law should be more successful in making quick and satisfactory sales than otherwise. When apples are packed in a standard barrel as established by Section 1 of the Sulzer law, and are plainly and conspicuously marked as containing one barrel of apples of one of the standard grades described in Section 2, such a statement, if true, would constitute a satisfactory compliance with the Net Weight Amendment to the Food and Drugs Act. Otherwise the package, if intended for interstate commerce, must be marked to comply with the Net Weight Amendment to show the quantity of the contents, either by weight or by dry measure or by numerical count. A statement of numerical count must be qualified by the size of the apples expressed as the average diameter in inches to be a statement of quantity.

With respect to Europe, the Office of Markets urges exporters to carefully watch the movement and assure themselves of steamer space and a demand on the other side before making

shipments. Latest announcements of steamship companies are to the effect that fairly regular schedules will be maintained between America and the United Kingdom.

American apple shippers are advised to stimulate the demand and increase their shipments to Latin America and the Orient. It is suggested that by co-operating with the Department of Commerce, extension of trade in this respect can be accomplished. Inquiries relating to these countries should be addressed to the Bureau of Foreign and Domestic Commerce, Washington, D. C. Shippers are urged to apply to the Superintendent of Documents, for the following publications, issued by that Bureau, which may be secured at the prices shown: Special Agents' Series, No. 62, 30 cents; No. 72, 10 cents, and No. 81, 25 cents; Special Consular Reports, No. 62, 10 cents, and Tariff Series, No. 19a, 5 cents. Remittances should be in cash or by money order. Stamps are not accepted. Attention is called to an announcement of the Department of Commerce that it will aid in every practicable way.

For the benefit of those who may not be disposed to exercise especial care in handling the crop, on the grounds that it will not be worth while, the Office of Markets suggests it as probably being true of this year that not only proper handling but also great diligence will be required for effecting satisfactory distribution.

The grower who gets into his orchard now sees anything else which is the matter with his orchard, has his attention called to anything which needs to be done to improve it, and learns a good lesson for next year's operations.

Pacific Coast Fairs, Land and Apple Shows
 California State Fair, Sacramento, September 2 to 9.
 Spokane Interstate Fair, Spokane, September 1 to 9.
 Southwest Washington Fair, Chehalis, August 28 to September 2.
 Oregon State Fair, Salem, September 25-30.
 Montana State Fair, Helena, September 25-30.
 Utah State Fair, Salt Lake, October 2-7.
 Washington State Fair, North Yakima, September 18-23.
 The Pendleton Round-up, Pendleton, Oregon, September 21-23.
 Idaho State Fair, Caldwell, October 1-6.
 Northwest Land Products Exposition, Seattle, October 4-11.
 Ninth National Apple Show, Spokane, November 20-25.
 Northwest Livestock Show, Lewiston, Idaho, November 26 to December 2.
 Pacific International Livestock Exposition, North Portland, December 4-9.

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KINGS COUNTY REFRIGERATING COMPANY

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T. A. Adams, President



Reverse side of the tidy red tin.

Copyright 1916 by R. J. Reynolds Tobacco Co.

Your supply of Prince Albert awaits your cheery nod at the nearest store that sells tobacco. Tippy red bags, 5c; tidy red tins, 10c; pound and half-pound tin humidors and that fine crystal-glass pound humidor with sponge-moistener top that keeps the tobacco in such excellent shape.

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PRINCE ALBERT has a value that coupons or premiums can't produce—*quality!* Premiums or coupons have never been offered with P. A. State or national restrictions on their use make no difference to P. A. Men get what they pay for when they buy the national joy smoke—*quality!*

P. A. comes to you with a *real reason* for all the pipe and cigarette rolling goodness and satisfaction it offers! It is made by a patented process that *removes bite and parch!* You can smoke it long and hard without a comeback! It affords the keenest tobacco enjoyment! And that P. A. flavor and fragrance and coolness is as good as that listens!

Prince Albert has won universal favor with men of *all* tastes all over the world! *It answers the universal demand* for tobacco—it does not bite, parch or kickback!

Flash-it-hot-off-the-reel, Prince Albert will let you cut loose on that old jimmy pipe or on a makin's cigarette like a hungry fox after a chicken!

Quickaction introduction to Prince Albert isn't any harder than just to walk into the nearest place that sells tobacco and ask for "a supply of P. A." You part company with a little change, to be sure, but it's the cheerfulest investment you ever made! For dividends-of-delight, Prince Albert backs clipping coupons square off the map!

PRINCE *the national joy smoke* **ALBERT**

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Your spark plugs will keep cleaner if you use a straight-distilled, refinery gasoline. A mixed or imperfectly refined gasoline breaks up and deposits carbon instead of exploding completely.

Red Crown
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STANDARD OIL COMPANY
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Northwest Land Products Exposition, Seattle

TO assist in the agricultural and horticultural development of Washington, Oregon, Idaho, Montana, Alaska and British Columbia, the Northwest Land Products Exposition, to be staged at the Arena in Seattle from October 4 to 14, will be the first exhibition of the kind in Washington. Already the enterprise has the official endorsement of the commercial bodies, not only of Seattle but over the states to be represented, and the great railways serving the Northwest recognize the exposition as a most helpful adjunct in the exploitation of the land with a view to encouraging homeseekers and will have a prominent place in the big undertaking.

In the great national and international expositions held in the United States, as well as the shows in foreign

lands, soil products have always received attention. This interest increased until the so-called land show became a fact. Land shows in the Coliseum in 1912, 1913 and 1914 attracted capacity crowds in the great Coliseum afternoon and night. The railroads presented magnificent displays and many states of the Union were represented by displays of fruits, grains, grasses and vegetables. The shows at St. Paul and Minneapolis, where the exhibit was staged under the authority of the seven states of the Northwest, closed with record crowds for attendance while the show was in progress. "It's the Lure of the Land," was the editorial comment of a great Chicago daily newspaper in explaining the presence of thousands of people daily to view soil products.

So at Seattle for eleven days every state, county and community in the Northwest will have an opportunity to have an active part in the eleven-day land school. The State Agricultural College at Pullman will be well represented, schools and colleges will have attractive exhibits, the States of Montana, Oregon and Idaho as well British Columbia will be represented by displays to show the nature of the forage and cereal crops produced on their lands.

From Alaska will come an agricultural display far greater than the exhibit at the A.-Y.-P. Exposition, for the northern country is now becoming widely known for the grains and grasses grown there, and the agriculture features of Alaska are now being exploited along with its marvelous production of minerals. This exhibit will be collected and arranged under the auspices of the Alaska Bureau of the Seattle Chamber of Commerce.

Dairy Day will be one of the features of the Exposition period and the display of butter, cheese and similar products will be complete in every detail. This will require the building of a special cold-storage system to preserve the exhibits. Cooking and canning contests will be offered as an attraction as will lectures by men who have devoted years of study to agricultural and horticultural possibilities in the Northwest.

The Manufacturers' and Land Products Show at Portland the last two years demonstrated that an exhibition of this character did more to acquaint people with the opportunities awaiting them in the districts away from the cities than countless pamphlets on the subject. Practically every county in Oregon had a display at the 1915 land show and all received vast benefits in the way of reaching men and women giving serious thought to moving from the city to the country.

With the advent of machinery on the farm the burden of the man who tills the ground has been lightened to a great extent. One section of the Exposition will be set aside for exhibits



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that will demonstrate by machinery in motion the latest and most modern methods of preparing the land.

It is intended that the Exposition at Seattle will present a long-looked-for opportunity to study soil products at close range. The county fair, as well as state fairs, offers this feature as the serious side with much success. In the city where thousands of people are constantly seeking something new the land show has demonstrated many times that it is the real medium whereby the masses receive much of their real knowledge of the land and what it can produce and go to their homes with a first-hand knowledge of the future awaiting them on the lands of the Northwest.

The railways serving the Northwest will all have displays. From the Seattle Land Show the immigration departments will select exhibits for display in Eastern and Middle Western ticket offices and for use on exhibition cars.

While the Exposition is in progress low fares will be offered for the round trip to Seattle, and coming in the fall when the farm work is light, a great attendance is expected. It is also planned to advertise the Exposition so that the various features will be brought to the attention of tourists in Seattle en route home after a visit to California or British Columbia, the national parks, or coming directly to

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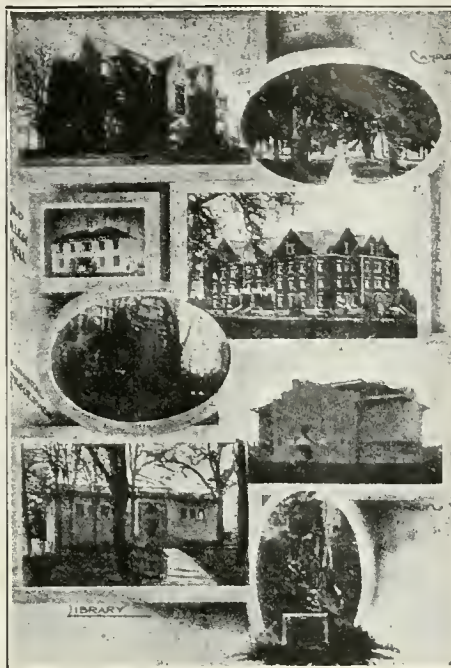
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the North Pacific Coast for the vacation period.

Entertainment features will be many and varied. Every organization in Seattle will have a special day at the Land Show. Ferullo's band, one of the great musical organizations of the country, will be heard in daily concerts, and tests, demonstrations, contests and other features will offer amusement for old and young alike each day while the First Annual Land Show is in progress. The Exposition will be under the management of D. D. Olds, formerly manager of the Fair Hesperides at Wenatchee and assistant manager of the National Apple Show at Spokane. Manager Olds will furnish premium lists on request.

Apples color and mature better, especially on the lower limbs, if the growth under the trees is mowed down.

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To occupy its new building this fall. Ample ground for athletic uses and a special provision for boarding students are attractive features of the new development.

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of Congress of March 3, 1879.

The Apple and Pear Price for 1916.—

The apple crop of the United States, according to the government report, in 1914 was 84,000,000 barrels; in 1915, 76,000,000 barrels. The estimate at the present time is 72,000,000 barrels. However, no producing sections are reported with bumper crops. A great many districts are already reporting poor quality. Although the crop of 1915 was only 10 per cent less, according to the government report, than 1914, yet the Western apple growers received nearly double the price. Apparently the price is not entirely a question of quantity. The season is not far enough advanced for fixing prices very definitely. It is too early to get scared. It is too early to go crazy. The pear situation indicates pretty definitely to the fruit grower that the pear grower of the Northwest was not onto his job. The pear market opened up on Bartlett at 95 cents. Many were sold at this figure. Soon after, Bartletts advanced to \$1.75 and \$2 per box. The canneries in California were paying \$80 per ton. It is not meant by this that the fruit grower should get foolish and hold for exorbitant prices. Wenatchee started the ball rolling by selling some cars of Extra Fancy apples at the following prices: Jonathan \$1.15; Black Ben \$1.10; Arkansas Black \$1.35; Winesap \$1.35, and Spitzenburgs \$1.50. All f.o.b. Wenatchee. The season looks like a fair one for everyone to make good money on apples, including the grower and the jobber, for the reason that the crop of the United States is not a bumper crop, for the reason that the quality is poor in some districts, and for the further reason that the business condition of the country is much improved over last year. However, this does not mean the grower should be unreasonable in his expectations or hold for too fancy figures. The apple grower will show good judgment if he takes into consideration the fact that

there are a lot of apples in the United States and that in order to get the best prices out of them consumption must be started with the beginning of the season, and the consuming public supplied regularly each month throughout the season at prices which will invite buying and create consumption, instead of prices that will repel buying and prevent consumption. It is a case where caution and good judgment should rule in the beginning and prevail throughout the season. In other words, opening prices should be such that will start immediate consumption and future prices should be governed entirely upon market conditions and how rapidly the apple crop moves.

The Fruit Growers Agency and Apple

Prices for 1916.—It is a well-known fact that some districts or some selling concerns can demoralize the apple markets on Northwest box apples very early, by going off half-shot and preventing others from getting market values. Such has happened in the past. There is no reason why it should happen this year. In fact, there is every reason why prices should not be unnecessarily low or high this year. Most of the important fruit selling concerns of the Northwest are affiliated with The Fruit Growers Agency. It is the duty of each concern to send salesmen or representatives to attend the conferences, which should be held as frequently as the situation justifies, for the purpose of discussing with and getting the benefit of each other's opinion and knowledge as to market values. Every selling concern can secure a lot of information on values and the opinions of others by attending these conferences, which will be a big help in determining apple values. It looks as though The Fruit Growers Agency has provided a possible means for the apple growers of the Northwest to obtain market values for box apples, which is all they can ever get or all they can expect.

The Ninth National Apple Show.—

Spokane is always wide awake and original, with a bunch of business men willing to put up money for any proposition that will benefit the farming community and fruit growers of the surrounding territory. Spokane was the first city to realize fully the importance of the fruit industry to the Northwest, and to Spokane belongs the honor of originating and holding the first apple show that was ever held anywhere in the world. A great many states in the Union have imitated Spokane by holding apple shows, and even the apple growers in Tasmania grew enthusiastic and held a wonderful apple show in 1916, somewhat similar to the apple shows in Spokane. Spokane realizes that many millions of dollars are invested in the apple industry of the Northwest. Spokane knows that the Northwest has climate and soil to grow the finest apples in the world. Spokane knows that the industry has been suffering from a depression largely due to the fact that we did not fully under-

stand the methods of distribution, increasing consumption, advertising the apple and salesmanship. Spokane intends to do her part by holding the Ninth National Apple Show, not only for the purpose of encouraging the industry, but for the further purpose of giving the growers from all sections of the Northwest an opportunity to attend the show and hear able speakers upon many important subjects, partaking afterwards in the discussion, with a view to solving some of the problems, including marketing, that are interfering with the success to which the apple growers are entitled. It is believed these problems can be solved. It is a sure thing that the conferences at the Spokane Apple Show will be a big factor in helping to solve them. The most progressive business men of Spokane are back of this show financially; therefore it is assured it will be a success in every way. It is certainly entitled to the support of every fruit grower, and every fruit grower who can possibly make an exhibit should do so. The railroads will make rates so low that no one can afford not to attend the Ninth National Apple Show.

The Washington State Fair.—The

Washington State Fair will be held September 18 to 23 in North Yakima, in the center of one of the greatest farming communities of the world. It is stated that Yakima shipped 35,000 cars of farm products last year; about 5,000 of this was fruit. The fair being held in the midst of this wonderful district is sufficient assurance for its success. The grounds are magnificent. The pavilion, with an immense floor space for exhibits, is a wonderful building. Arrangements are made for the stock exhibits, for the reason that an immense amount of stock is raised in Yakima. Every fair ever held in North Yakima has been a wonderful success, both in exhibits and attendance. Every fruit grower and farmer should attend this fair, for two reasons: because all of these wonderful exhibits are of great educational value, and because there is an opportunity of meeting fruit growers and farmers from all over the country, from whom they can obtain a lot of valuable information, learn of their personal experiences, ways and methods of doing things. All of which is a great help. In addition to this everyone can be assured of a splendid time. The city of North Yakima is noted for its big-hearted, successful business men, so everyone can depend on a hospitable reception.

The Oregon State Fair.—The Oregon

State Fair will be held at Salem September 25 to 30. This fair for many years has been recognized as one of the big factors in the development and promotion of the farming and fruit industry of the State of Oregon. Every show held at Salem has been a success. The Oregon State Fair is particularly strong in stock exhibits, being located in one of the oldest and best farming sections of the Northwest, which means there is always a splendid exhibit of farm pro-

ducts and farm machinery. The Willamette Valley being the oldest fruit section of the Northwest also means that the fruit displays are not only very attractive, but highly educational. The pavilion for exhibition purposes is very large, situated in a beautiful grove. The grove is a big attraction, providing camping grounds for families who desire to bring their tents and camp out during the fair. This fair is entitled to the support of the farmers and fruit growers of the State of Oregon. They should show their encouragement by making exhibits, if possible, and nothing but sickness on the part of any farmer or fruit grower should be sufficient excuse for not attending. The railroads will make very low rates on return tickets.

The Northwest Land Products Exposition.—Seattle, always an enterprising city, when the Alaska business was being developed held a wonderful exposition known as the Alaska-Yukon-Pacific Exposition, and now, in realization of the fact that the Northwest is dependent primarily and largely upon its land products, will hold a show to be known as the Northwest Land Products Exposition, in Seattle October 4 to 14. This exposition is entitled to the support of all of our farming sections in the way of exhibits. Every fruit grower and farmer who can exhibit should do so, and no one should fail to attend. The show will contain many exhibits which will be instructive, educational and well worth seeing. The Northwest Land Products Exposition is entitled to the fullest support of all the business interests, because the business interests are dependent in a large measure, in the Northwest, on land products.

The Northwestern Fruit Exchange, under date of August 21, states that, largely through their efforts, Mr. Robinson, traffic manager of the Northwestern Fruit Exchange, has been working earnestly with the railroad officials for securing the privilege of "Diversion of Fruit Shipments After Arrival at Destination," and are pleased to announce that Mr. F. L. Norman, general agent of the Grand Trunk Railway at Seattle, has advised them that on his line this will be effective in the near future. The Northwestern Fruit Exchange states that much credit is due Captain Paul H. Weyrauch of the Fruit Growers Agency for co-operation along this line.

The Round-up.—Pendleton will hold its annual Round-up September 21 to 23. This show is one of the most novel, interesting and lively of any of its kind that has been held anywhere in the world. Everyone who has ever attended one of these Round-up shows has come back full of enthusiasm, stating it is the most wonderful thing they have seen. Every fruit grower and farmer who is going to take a few days off this year, if he likes fun and good sport, should attend the Pendleton Round-up. It will be a thriller.

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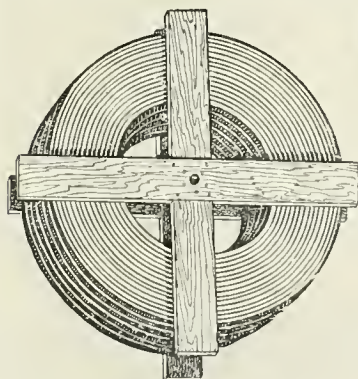
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One Hundred Cars of Red Apples
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Mr. Planter: Do what you should have done
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a commercial orchard bordered with the
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Mr. Salesman, write us the territory.

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In-Transit Rates.—There is a growing demand on the part of the apple growers in the Northwest for in-transit rates. Already a number of in-transit rates have been made, enabling the fruitgrowers to use cold storage facilities in St. Paul, Chicago, Kansas City, Buffalo, New York and other points, but many other important cities are not included, among which may be mentioned Indianapolis, Columbus, Cincinnati, Cleveland and Vincennes. This is a matter that is worthy of attention from everyone who is interested. It is a well-known fact that it is a big advantage to the fruitgrower to have his apples stored in as many points as possible which are at or near big consuming sections. Cold storage is an absolute necessity in the East and also a necessity in the West, for the reason that the total apple crop cannot be sold at harvesting season and in order to realize the best possible prices it must be cold stored and sold to the public as the consumer requires.

"Handling Fruit for Distant Markets" is the subject of a very interesting article in this issue and one which should command the attention of every fruitgrower. There is no question but that much poor condition on arrival is due to improper handling and harvesting of fruit more than any other one factor, causing an immense annual loss. By improper handling usually is meant rough handling. Improper handling, however, may be extended to picking too early or picking too late. A few years ago the loss on arrival in shipments of oranges was a serious menace to the business. Growers were not aware of this fact until the government carried on an investigation under the direction of G. Harold Powell, who discovered that the rough handling of oranges bruised the skin sufficiently to break it, and wherever this occurred mould and decay set in, causing millions of dollars of loss annually. There is nothing more important than proper and careful handling of fruit at harvesting time.

The Apple Crop of 1916.—The Chamber of Commerce of the United States, Washington, D. C., has issued under date of August 14 a statement in reference to the apple crop now in sight, saying that the crop will be somewhat more abundant than the average crop, though deficient in some sections. Further information about other varieties of fruit says: Grapes are doing well in New York and California; peach shipments have been good from many states, although in some states injured by cold; citrus fruits reported in fine condition. Shipments of cantaloupes and watermelons have been running very heavy.

Information from Michigan states they are on the road to standardization and expect to present at the State Society meeting at Grand Rapids a draft for standardization, somewhat similar to the New York classification.

Cut Your Apple Storage Cost

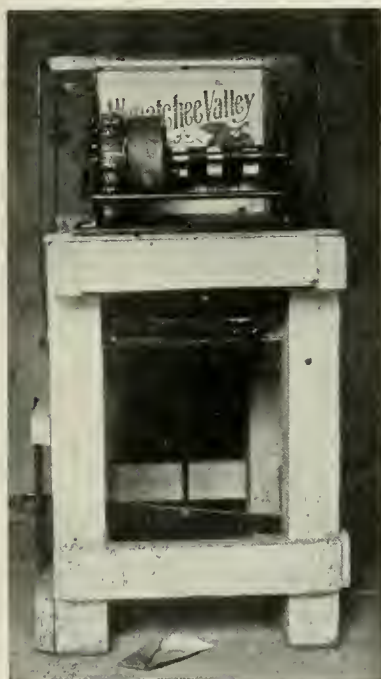
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Any infringement will be prosecuted.

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125 EXTRA FANCY WINESAP 40 LBS. NET JOHN DOE
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It eliminates untidiness and unevenness in marking.

Saves time in picking up five different stamps separately, as all these stamps are placed on a wheel and the entire marking of the box, as shown above, is done in one movement and as quickly as one stamp is put on by the old method. The machine works automatically and is self-inking.

The Shotwell Box Marking Machine is a device that saves labor, does it neatly with dispatch. Made to be attached to any open end press and can be adjusted to mark any standard fruit box of any variety, apples, pears, peaches, oranges and lemons, etc.

It is made of malleable iron, assembled ready for use.

With each machine is included, without extra charge, eighteen number stamps, three grade stamps, one net weight stamp, one two-line grower's address stamp, ten variety stamps and an ink pad. Price, neatly packed ready for shipment, \$15.00, f.o.b. Wenatchee, Washington.

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WENATCHEE, WASH.

The Agency is dealing with problems of transportation. In this, as in other matters, co-operation makes it easy to handle problems which would otherwise go unsolved.

One of the important activities of the Agency is the development of foreign markets. One district or one company cannot do this. It requires the Northwest working as a unit to get results.

Another activity of this organization which is of particular importance to the grower is the standardization of the form of account sales to be used by shipping organizations in making reports to the grower. Through the use of such a form the grower can make a true comparison of the net returns and the services rendered by the different organizations.

The fruit growers of the Northwest should realize that The Fruit Growers Agency, Incorporated, presents the opportunity of a lifetime. It enables growers, selling agencies and districts to co-operate as never before, and it enables the fruit industry of the Northwest to receive the assistance of the Federal Office of Markets and Rural Organization. Since the funds of this government department are limited and aid is extended only to the sections showing the most interest, it is now up to the fruit growers to avail themselves of this opportunity to co-operate and show the government that this section profits by its aid.

The officers and trustees of The Fruit Growers Agency are as follows: Paul H. Weyrauch, president; J. B. Adams, vice president; P. R. Parks, temporary secretary.

Trustees: J. B. Adams, Wenatchee, Washington; E. W. Ross, North Yakima, Washington; C. H. Swigart, North Yakima, Washington; P. R. Parks, Spokane, Washington; Wilmer Sieg, Hood River, Oregon; W. F. Gwin, Seattle, Washington; Paul H. Weyrauch, Walla Walla, Washington; D. L. Ingard, Payette, Idaho; W. M. Sackett, Hamilton, Montana; B. W. Johnson, Corvallis, Oregon.

The executive officers of the Agency are located at Blalock Station, near Walla Walla, Washington, where President Paul H. Weyrauch is working with the aid of the Government Office of Markets.

Oregon State Fair

The 1916 Oregon State Fair will be "educational" in the strictest and broadest sense of the term, and no pains, labor or reasonable expense is being spared by the board of directors and Secretary-Manager A. H. Lea to make of it the biggest, cleanest and best State Fair in every respect in the fifty-five years' history of the institution.

One of the first innovations which the board put into effect, in organizing for this year's exhibition, was to abolish the old system of departmental superintendents and to place every department under the direct charge and supervision of a member of the board. This change was inaugurated for the dual purpose of arousing greater per-

The Opportunity of the Fruit Grower

The Fruit Growers' Agency, Incorporated

By Paul H. Weyrauch, President, Walla Walla, Washington

TO fill a need which no other organization in the Northwest has been able to fill, The Fruit Growers Agency, Incorporated, was organized. The growers and business men of the Northwest have long realized that the lack of co-operation and organization between the districts has resulted in cutting down the profits of the grower.

Last year the growers and business men of the Northwest petitioned the Federal Government to lend expert advice and aid in the establishment of some form of organization to remedy this condition. Three experts were sent to the Northwest by the Office of Markets and Rural Organization to investigate conditions. They conferred with men active in every branch of the fruit game and suggested a plan which resulted in the organization of The

Fruit Growers Agency, Incorporated, at Spokane, Washington, on March 24, 1916.

The Fruit Growers Agency, Incorporated, was organized to aid and protect the grower. It controls over 75 per cent of the Northwestern apple crop and has among its members nineteen of the largest selling agencies of the Northwest. Thus the grower, by working through this organization, is able to handle problems too large for any one district.

This new organization proposes to supervise a uniform contract between grower and selling agent. It endeavors to bring about a standardization of packing methods throughout the Northwest. It collects information as to crop conditions, shipments and markets, and distributes such to its members.

The Paris Fair

HOOD RIVER'S LARGEST
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RETAILERS OF

EVERYTHING TO WEAR

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A PLEASANT ROUTE EAST

Along the Grand Canyon of the Columbia, the Rim of the Great Snake River Canyon and the American Wonderlands, Yellowstone or Glacier Parks.

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R. H. CROZIER, A. G. P. A.
PORTLAND, OREGON

of the board from Union County, to be assigned to the agricultural and horticultural departments, two of the most important responsibilities involved in a big institution of the character which the new board is promoting. It is the duty of these departmental heads to look after the details of space allotment and arrangement and to lend every encouragement toward securing a thoroughly representative exhibit in their respective departments, and each and every one of them is taking hold and making such splendid progress that it will tax the available space to the utmost to accommodate the exhibits already secured and in prospect.

This is especially true in the agricultural and horticultural departments, which, under the most active and efficient direction of Mr. Reynolds, are already assuming record-breaking proportions. He is making a most thorough canvass of every section and community of the state, to arouse interest in the different competitive exhibits, particularly in the county and individual products' exhibits, and he reports splendid success. Already eighteen of the thirty-five counties of the state have decided to make county exhibits in the new pavilion, a greater number than has ever before exhibited at one time, and several others still have the matter under favorable consideration.

In the horticultural department there will be the largest, most elaborate and thoroughly representative exhibit of fruits ever brought together under one roof in Oregon since the Lewis & Clark Exposition. Every growers' and packers' association in the Willamette, Rogue, Umpqua, John Day, North Powder and Hood River Valleys, and other fruit growing sections of the state, have either made arrangements for space and are preparing their exhibits or are making arrangements to do so, and there are scores of individual growers who have signified their intention of entering the individual farm products competition.

"The State Fair, properly organized and conducted, is the best educative agency in existence and it should have the undivided and unprejudiced support and co-operation of every citizen of the state," said Secretary-Manager A. H. Lea at a recent meeting of the board of directors. "Every county in the state should consider itself in duty bound to other portions of the state and to posterity to make a complete exhibit of its resources and products at the State Fair, not only from an educational but from an advertising standpoint. Every exhibit sent to the State Fair, whether animal, vegetable or loaf of bread, should carry its lesson in thrift and progress, and every person who attends the Fair should come with the expectation of being benefitted from both a moral and educational viewpoint. It is decidedly a state institution and every loyal citizen should put his shoulder to the wheel and boost for it."

Now the tall weeds and summer grasses in the orchard, allowing them to lie as a mulch under the trees.

APPLES

are our main specialty the year round—we handle on commission basis.

Most of our trade is among retailers and high class jobbers.

We desire to hear from individual growers and associations who have good fruit, and who know how to put it up so as to co-operate in building a reputation with the best buyers in Chicago and in other Eastern markets.

If you don't know of our policy—our reputation—please write us for names of growers and shippers on the Pacific coast who have dealt with us, and who will be glad to answer your inquiries.

Market information promptly and cheerfully furnished at all times.

We employ no traveling men—we wait your coming to us, and it's worth your effort to get in touch with us.

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require but little more care the following spring. Fall is the season to successfully fight scale and similar tree diseases by spraying, and you want the best equipment obtainable for this work. MYERS will fill the bill, and whether your orchards are extensive or include but a few trees there is a MYERS OUT-FIT that will just fit your needs. Myers Spray Pumps are also adapted for painting, disinfecting and similar work.

The Myers Line Includes Bucket, Barrel and Power Pumps and Complete Outfits with such improvements as our patented easy operating Cog Gear Head on Hand Pumps and Automatic Pressure Controller on Power Pumps—You get these and many other exclusive features when you purchase a MYERS.

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sonal interest and creating a finer sense of duty and responsibility in every single member of the board, to create a friendly spirit of competition between them and bring about the best results possible with the highest standard of efficiency consistent with economy.

Under this arrangement it fell to the lot of J. E. Reynolds, the new member

Fruit Crop Estimate August 1, 1916

[Office of Information, U. S. Department of Agriculture.]

Apples—Apple prospects improved more or less during July in the Atlantic Coast states, also in the Pacific Coast states, but declines in nearly all the Central states, the decline being due largely to the dry hot weather. The August 1 forecast for the entire United States is 71,600,000 barrels, which compares with an estimated production last year of 76,700,000 barrels and in the preceding five years a yearly average of 66,000,000 barrels. Thus the crop as a whole will probably be smaller than last year's big crop, but somewhat larger than an average crop. Conditions vary, however, in different sections. In the New England states 4,864,000 barrels are forecast, compared with 2,852,000 last year. Baldwins are reported to be short, however. In New York the forecast is 12,062,000 barrels, compared with 8,528,000 last year, and in Pennsylvania 6,562,000, compared with 5,085,000 last year. It thus appears that the North Atlantic states will have materially more apples than last year; slightly more are also indicated in Maryland, West Virginia and North Carolina. In Virginia, however, the forecast of 4,180,000 is slightly less than last year's crop of 4,393,000 barrels. In all the Central states except Michigan the forecast is for smaller yields than last year; Ohio 4,028,000 barrels, compared with 5,984,000; Indiana 1,867,000, compared with 3,883,000; Illinois 1,921,000, compared with 4,716,000; Iowa 1,715,000, compared with 3,225,000; Missouri 3,520,000, compared with 6,287,000; Kentucky 2,656,000, compared with 4,170,000; Arkansas 1,143,000, compared with 1,183,000. In Michigan, however, the forecast is an increase, being 4,810,000, compared with 3,150,000. Also in the Pacific Northwest the forecast is for larger yields than last year, except in Idaho.

Next month the Bureau of Crop Estimates will forecast the production of the more important varieties of apples this year.

Peaches—A short crop of peaches is indicated by conditions on August 1, the forecast of production being only 40,300,000 bushels, compared with an estimated production of 63,500,000 bushels last year and 43,800,000, the average of the preceding five years. The crop is shorter than last year in every important producing state except Indiana and Illinois. The shortage is relatively greater in the Southern states than in the Northern states. Thus the August 1 forecast and last year's estimated production, respectively, in important states, are: Georgia, 3,711,000 bushels and 5,330,000 bushels; Alabama, 1,365,000 and 2,640,000; North Carolina 1,081,000 and 1,955,000; Tennessee, 1,330,000 and 2,460,000; Arkansas, 2,948,000 and 5,940,000; Missouri, 1,320,000 and 3,300,000; Kentucky, 1,238,000 and 1,320,000; Illinois, 1,132,000 and 874,000; Michigan, 2,065,000 and 2,360,000; New York, 1,359,000 and 2,106,000.

Grapes—Crops show a decline of about 2 per cent to an August 1 condition of 80.8, being an improvement of 1 in New York, a decline of 3 in Pennsylvania, a decline of 10 down to 75 per cent in Michigan, with condition still lower in the commercial belt, and average declines of 5 to 10 in other North Central states. The California condition declined from 83 to 82. The present average for the United States is 80.8, 4 below the ten-year average and 4.5 below last year at this date.

Pears—Pears show a condition of 59 on August 1, compared with 60.8 on July 1, being now 2.2 below the ten-year average, and 3 below last year's condition on this date. The crop in New York is the same. In the other Central Atlantic states it is somewhat lower. In the North Central group east of the Mississippi conditions have fallen off from an average of 63.4 to a present condition of 56.6. In the Southern states they have slightly declined, while in California a slight improvement is recorded.

Zerolene at the Front.

The local Standard Oil agent recently received from J. E. Balsley, district sales manager of the Standard Oil Company at Phoenix, a report on the operation of the government automobiles and trucks along the Mexican border.

"A great many of these machines," writes Mr. Balsley, "are being lubricated with Zerolene oil. The intense heat and great amount of low gear work necessary in the sand make perhaps the best test possible of a motor oil. I am glad to report that Zerolene is doing the work in fine shape. Due to its asphalt-base origin, it keeps its lubricating value under the most trying heat conditions, and none of the machines have been at all bothered with carbon deposits in the cylinders."

WATSONVILLE, July 11, 1916.

Editor Better Fruit:

While in Hood River recently I discussed with you the question of the restriction of the shipment of disease-infested fruit to the markets of California. You told me, if you remember, that you would be glad to assist as far as possible, especially in the matter of a bitterness of feeling which I encountered in certain sections.

This feeling of resentment is, no doubt, due to a misunderstanding of the real attitude of the California growers. It seems to be the general impression in some places that we are attempting to exclude all grades of apples. This is not the case. California is a splendid market for the better quality of fruit from the Northwest and there is no intention or desire to interfere in any way with this legitimate business, but we do object, and rightly, to the dumping of a certain grade of apples which were shipped in last season under various names to disguise the real one—culls. These came here in all sorts of containers, crates, sacks, and, I regret to say, in many instances in standard boxes, with disastrous results not only to the orchardists here but to your own as well.

It should not require a great deal of argument to convince the shippers of Oregon and Washington of the folly of a repetition of last year's shipment of inferior fruit.

From a financial standpoint it was certainly not a success. The prices received for a great deal of it would not pay the cost of handling,

No Chicken Mites or Lice

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PORTLAND, OREGON

and, in most instances, as far as returns are concerned, the grower had much better have thrown his culls in the river. The average price of cull apples from the Northwest, I am creditably informed, was 70 cents to the retailer here. Deduct cost of packing, commissions, freight, etc., and what could the grower receive?

Every car of culls took the place of a car of good apples from which some profit might have been derived, and the mere fact of the offering of large quantities of inferior stock at ridiculously low figures had a great tendency to cause a slump in the prices obtainable for the better grades.

Aside from the above, there is another reason why our most progressive fruit men object to the shipment of inferior apples. California is, as you know, endeavoring to standardize the packing of all fruit, but we cannot ask our own people to refrain from marketing infested grades as long as we permit the orchardists of other sections to send them here and sell, we might say, at their very doors.

The reputation of the pack, which your leading shippers have worked so hard to establish, was certainly not enhanced by the action of some of them last season.

With these facts before you I trust you will see your way clear to making editorial comment upon the situation, to the end that we may secure the active co-operation of the growers and shippers of Oregon and Washington in our effort to maintain the standard of our local markets.

With kindest personal regards,

Very respectfully,

A. W. TATE, Jr., Chief Inspector.

PORTLAND, OREGON, July 3, 1916.

Editor Better Fruit:

In the June issue of "Better Fruit," on pages 25 and 26, you have an article entitled, "Where the Names Come From," and I want to draw your attention to a few mistakes regarding the names of some of the fruits originating in Germany.

Gooseberries—We have in Germany red and yellow gooseberries, and they are called rote und gelbe stachelbeeren. They are not called Johannisbeeren; in fact, they are currants.

Currants—We have red and black currants called rote und schwarze Johannisbeeren.

Raspberries—We have in Germany red and yellow raspberries called rote und gelbe Himbeeren, also Beere der Hindin.

Trusting this may be of interest to you, I am,

Yours respectfully,

C. R. GRAESEN.

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We handle more box apples than any concern in Ohio and want to hear from every grower and shipper who will have either large or small lots to offer.

Let us hear from you at once.

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REFERENCES: ANY BANK OR CREDIT AGENCY

Report of Peddling from Cars Committee

Address by George G. Grupe, Chairman, Before Western Fruit Jobbers

THE practice of selling from cars has been increasing steadily each year. There seems to be no support or opposition to the practice on the part of the railroads. The lack of opposition on the part of the railroads has been taken advantage of by a class of small shippers and speculators, who only become active at certain seasons of the year when they see an opportunity to make a profit for themselves. The peddlers or speculators run cars into different markets and as they have no overhead expense, because they do not have any clerk hire, delivery sys-

tem, rent, taxes or insurance to pay, they make mean competition for the legitimate jobbers and retailers, who have established places of business and employ labor, pay taxes and in other ways support the community in which they are located. Furthermore, by congesting the public team tracks with peddler cars the legitimate jobber is inconvenienced. These peddlers generally get the most favorable locations on the team tracks, and by holding cars out of service, while they are selling their wares from these cars, they make it necessary for the railroads to spot the cars for the regular jobbers in less favorable locations and generally a greater distance from their places of business; thereby putting the regular jobber, who is an all-year-round patron of the railroad, to considerable inconvenience and greater expense in hauling his goods from the cars.

Not only is this peddler practice harmful to the jobber, but is also harmful to the large retailer, who would buy some of his goods in carload lots, but is afraid of competition from peddler cars. The practice is harmful to the grower and shipper, inasmuch as the peddler frequently demoralizes the markets, thereby causing the regular jobber to stop buying at producing points until he can buy sufficiently low enough to enable him to compete with the peddler car, and it causes the commission merchant, who sells consignments on commission for the grower, to meet prices made by peddlers, thereby reducing the net returns to the grower. It is the opinion of your committee that every member of our association should endeavor through the representatives he sends to producing points, to educate the growers to the fact that peddling results in lower prices for the grower.

By cars being held out of service, while being used as sales rooms, the railroad companies do not have the use of their equipment and in many cases shippers are inconvenienced through the railroad not being able to furnish cars promptly for them to ship in, as

the peddler is most active at the very season each year when railroads have the greatest demand for cars. There is a prejudice on the part of a class of growers and shippers against the elimination of the peddling evil. When your committee took this matter up with the several railroads that were permitting peddling on their lines, it was found that the proposition had been before the General Managers' Association of the Western Trunk Lines for some two years, but no action had been taken. In some cases it was found necessary to take the proposition up personally with the higher-up officials of the railroads—generally the vice-

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Disk Harrow—Single or Double Action—light in draft and built for a lifetime of service. If your dealer has not the genuine CUTAWAY, write to us direct. Be sure to write us for our new free book, "The Soil and Its Tillage."

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presidents in charge of operation. But your committee desires to mention particularly the support given by the General Freight Agents of the Union Pacific, the Rock Island, the Northwestern, the Milwaukee and one Assistant General Freight Agent of the C., B. & Q.

Your committee was received most cordially by the different railroad officials and they listened most attentively to the arguments put forth for the elimination of the peddler cars. The committee desires to mention particularly that, in the conferences with the railroads, no threats of reprisal were used or at any time found necessary. The greatest co-operation was given by the railroads and all they asked of your committee was logical reasons why the peddler cars should be eliminated. Some opposition developed on the part of the State Railway Commissions, probably at the instigation of some grower or association. The State Railway Commission of Nebraska suspended the tariff's carrying the prohibition against peddling, and the hearing was held at Lincoln, Nebraska, before the Railway Commission. A decision was rendered, but we have not yet received a copy of it. We understand the State Railway Commission of Montana suspended the C., B. & Q. tariff, but we have no advice as to what action was taken in that case. The Public Utility Commission of Illinois suspended the C., B. & Q. tariff in Illinois, and your chairman attended the hearing before the examiner, appointed by the commission, and is pleased to report that all the evidence adduced at that hearing was in favor of eliminating the peddler. No protests had been made against the adoption of the tariff, but the examiner explained that the commission suspended the tariff so they could hold a hearing and ascertain the attitude of the railroads toward regular jobbers, commission merchants and brokers. We expect a favorable decision from the commission. The Interstate Commerce Commission was requested by the Iowa Commerce Council and one of the State Railway Commissioners of the State of Iowa to suspend the tariffs, but they took no action, which indicates that the Interstate Commerce Commission is in favor of any reasonable action by the railroads to induce the prompt unloading of cars after arrival at destination, thereby keeping the cars in service. It is reasonable to assume that railroad cars were built for the purpose of transporting commerce and were not intended to be used as retail store-rooms or warehouses.

Your committee questioned its jurisdiction to appeal to railroads operating east of Chicago to eliminate the peddling practice, and having ascertained that the National League of Commission Merchants is opposed to the peddling evil, your committee has taken the proposition up with Mr. French, the business manager of the league, with a request that they co-operate with our association and further request that they appoint a com-

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Consignments and Correspondence Solicited

mittee at their annual convention at Indianapolis this week to co-operate with our committee on the peddling evil. In this way the influence that can be brought to bear on the railroads will be greater and the proposition will be broadened into one of national importance.

Below is a record of the railroads that have already adopted the prohibition against peddling: Missouri, Kansas & Texas Ry.; Texas Central; White Falls Lines; Galveston, Harrisburg & San Antonio Ry.; Houston East & West Texas Ry.; Texas & New Orleans Ry.;

Trinity Brazos Valley Ry.; St. Louis Southwestern Ry.; San Antonio, Arkansas Pass Ry.; Kansas City, Mexico & Orient Ry.; International Great Northern Ry.; Texas Pacific Ry.; Beaumont, Sour Lake & Western Ry.; Brownwood North & South Ry.; Paris & Great Northern Ry.; Ft. Worth, Rio Grande Ry.; San Benito & Rio Grande Ry.; Orange & Northwestern Ry.; St. Louis, Brownsville & Mexico Ry.; St. Louis, San Francisco & Texas Ry.; Gulf, Colorado & Santa Fe Ry.; Missouri Pacific Ry.; St. Louis, Iron Mountain & Southern Ry.; Atchison, Topeka & Santa Fe

Ry.; Chicago, Burlington & Quincy Ry.; Chicago, Rock Island & Pacific Ry.; Chicago, Milwaukee & St. Paul Ry.; Great Northern Ry.; Union Pacific Ry.; Chicago, North-Western Ry.

There are a number of other lines that have signified their intention to adopt the prohibition against peddling shortly. Two or three are holding off to see what lines that are competitors of theirs will do. As many of the larger lines have now taken action, it should be an easy matter to get the others to come into line.

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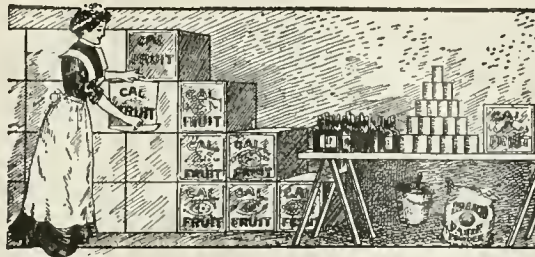
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Canning Without Sugar

By J. S. Caldwell, By-Products Specialist, Washington Agricultural Experiment Station, Pullman, Washington

As a consequence of the rapid rise in cost of sugar, many housewives who usually prepare their own canned fruits, preserves, jams and jellies are permitting cheap and abundant crops of fruit to go to waste rather than purchase the sugar necessary to preserve it by their usual methods. Wherever this is the case, winter supplies of canned fruits must be pur-

chased later at a cost greater than that of home production, or the diet of the family must be restricted with danger of injury to health. Many housewives are apparently unaware that practically all fruits may be successfully canned without the use of sugar. Such fruit preserves more of the natural appearance and flavor than does fruit put up in heavy sugar syrup, is fully as palatable and much more easily digested, is in better condition for use in cooking and is available for all purposes for which fruit canned in syrup could be used. A heavy sugar syrup aids in a slight degree in preventing the growth of the yeasts and bacteria which cause spoilage, but perfect sterilization makes its use unnecessary.

Fruits may be canned without the use of sugar by any method which the housewife is accustomed to use, but in every case the following rules should be observed: (1) Fruit to be used for canning should be firm, not over-ripe, and free from decay. Vegetables should be young and tender. To attempt to use very dirty, over-ripe or decayed fruit, or old, tough vegetables is to invite failure, since it is very difficult to sterilize such materials. (2) Jars should be tested by partially filling with water, adjusting rubbers, tightening covers, inverting and shaking. (3) Jars, covers, rubbers, spoons, cups, funnel and all utensils which are used in canning must be placed in a pan of cold water deep enough to cover them, placed on the stove and boiled for 20 minutes. Allow them to remain in the hot water until needed for use. This will prevent subsequent breakage and will insure perfect sterilization. (4) Rubbers should never be used a second time. (5) The neck of the jar should never be wiped off before sealing, as the cloth will almost certainly leave bacteria or yeasts in the jar.

The cold-pack method has rapidly come into general favor, since it pre-

serves more of the natural color, appearance and flavor of the fruit, and also saves the time, energy and labor of the operator. It requires no special equipment other than a washboiler, lard can or other deep vessel with flat bottom and tightly fitting cover. Make a false bottom of wire netting or light wooden slats, nailed to cross pieces and

The First National Bank

HOOD RIVER, OREGON

A. D. MOE - - President
 E. O. BLANCHARD - Cashier

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 Assets Over \$500,000

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Tarred Berry Twine

For tying Lagonberry, Raspberry and Blackberry vines or other small fruits and shrubs to trellises, stakes or supports.

A single Tarred Yarn, about 400 feet to the pound, put up in 5-lb. balls, 10 balls to the sack. The time will soon be at hand for cleaning up berry patches and getting vines and shrubbery in suitable condition for another year.

Sold by All Dealers Handling Orchard Supplies

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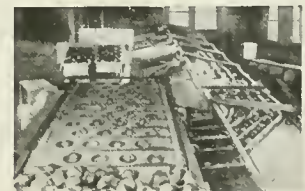
The Portland Cordage Co.
 PORTLAND, OREGON

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

"Francis Type"

Fruit Grading Machines

and Picking Bags



Write for Information

Western Fruit Grader and Mfg. Company

Grand Junction, Colorado

Come and Live and Prosper—

ORCHARDING in NEVADA COUNTY, CALIFORNIA—the Grand-Prize-Winning Home of the Bartlett Pear

CLIMATE ideal for fruit-raising—ideal for health. Altitude (2500 feet) just right for healthy orchards and healthy orchardists. There's money in Bartlett Pears and Nevada County, California, grows the best in the world. Won the highest award at the Panama-Pacific International Exposition.

Land values have not been boosted sky-high here. Good average along the railroad costs but \$40—only \$100 just outside the city. Write for literature to

CHAMBER OF COMMERCE, Grass Valley, California or Promotion Committee, Nevada City, California

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

WE SPECIALIZE IN THE STORAGE OF APPLES

And offer **LOW INSURANCE**
MODERN STORAGE FACILITIES
FOUR TRUNK LINE RAILROADS
FAVORABLE FREIGHT RATES

ALONG WITH A

Storage Capacity of 375,000 Boxes

AT FAVORABLE STORAGE RATES

All fruit for shipment is put in proper shipping condition by experienced help.

Ebner Ice and Cold Storage Company

Flora, Illinois; Carmi, Illinois; Washington, Indiana; Seymour, Indiana



**Make It Easier
For Them**

SPARE the horses. Mica Axle Grease makes easier pulling. It gives a smoother bearing than ordinary grease, because it contains powdered mica—blended with the grease by a special process. The mica keeps the spindle smooth, resists wear and pressure, and makes the grease last twice as long. Get a can from your dealer today.

Standard Oil Company
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MICA AXLE GREASE

Oregon Nursery Company

ORENCO, OREGON

Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate. Write us about your wants before buying.



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PRUNING SHEAR**

Pat'd June 2, 1903.

RHODES MFG. CO.,

820 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only
pruner
made that cuts
from both sides of
the limb and does not
bruise the bark. Made in
all styles and sizes. We
pay Express charges
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Write for
circular and
prices.

cut to fit into the bottom of the vessel used. If an oil or gasoline stove is available, increase the comfort of the operator by moving the entire outfit into a shady spot outside the house. Place the can of boiling water containing jars, covers and utensils on the stove and keep hot. Put the false bottom in place in the washboiler, fill the boiler about one-fourth full of warm (not hot) water, and you are ready to begin work.

Transfer a jar from the boiling water to the washboiler, fill it immediately with cold, raw fruit, packing it down firmly. Add enough cold water to fill the jar within one-half inch of top, using a knife or spoon to displace air bubbles. Take a rubber from the boiling water and fit it on, then set the cover loosely in place. Continue the process until the boiler is filled with jars. Now fill the boiler with cold water to within one and one-half inches of the tops of the jars, fit the boiler cover tightly on, place the boiler on the stove and heat to boiling. In the case of quart jars, the following time table may be used as a guide: For strawberries, blackberries, loganberries, red or black raspberries, continue boiling vigorously 8 to 12 minutes. For acid fruit such as cherries, currants or gooseberries, boil vigorously for 5 to 8 minutes. For apples, peaches or pears, boil vigorously for 20 to 35 minutes, the time depending upon the variety and degree of ripeness of the fruit. Persons working at an altitude greater than 2,500 feet will find it necessary to increase the times here suggested by about one-fourth. When the fruit has boiled for the specified time, remove the jars from the boiler and immediately screw the covers tightly on. Wipe dry and place on a shelf out of drafts to cool, inverting the jars in order that leaks may be detected at once.

The open-kettle method differs from the cold-pack method in that the fruit is placed in a porcelain lined or other suitable vessel with enough cold water to cover it and cooked for the necessary



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OF
GREASE

C. & S. Axle Grease has consistency (standing up under all conditions of temperature) wearing qualities (holding up under severest conditions); and the price, based on its quality, is reasonable.

WHITTIER-COBURN COMPANY
San Francisco

time before transferring to the jars. Jars, rubbers, covers and utensils are sterilized in boiling water as described above. When the fruit is sufficiently cooked, a jar is transferred from the boiling water to a plate or dish, packed with the fruit and filled to overflowing with the boiling juice, a rubber and a cover are taken from the hot water and fitted on, and the cover is screwed tightly down. Do not delay a moment in closing the jar tightly, and never attempt to wipe off the overflowing juice before putting the cover on, as you will almost surely introduce organisms which will cause spoiling of the fruit.

While this method is a favorite one with many canners, it is wasteful of fuel and of time, since the amount of fruit which can be prepared at one time is small; the operator must stir the fruit continually to prevent sticking and scorching, consequently is exposed to the full heat of the stove, and the fruit loses much in appearance and flavor. For these reasons, those who have given the cold-pack method a fair trial usually adopt it.

If fruits are allowed to boil for the full times stated above and are sealed without allowing anything which has not been thoroughly sterilized by boiling to come into contact with the fruit or cover, they should keep indefinitely. If the operator is working at high altitudes, the method of double sterilization should be employed. Proceed by either of the methods just described, but after 24 hours return the jars to the washboiler, fill it to the shoulder of the jars with cold water, place on the stove and bring to boiling. When the water begins to boil—not before—loosen the covers sufficiently to permit the steam to escape and continue boiling, with the cover of the boiler in place, for 8 to 10 minutes in the case of the softer fruits, 12 to 15 minutes in others. Now remove the jars from the boiler and tighten the covers while fruit is still actually boiling in the jars. This method should always be employed when tomatoes, peas, beans or vegetables low in acid content are being canned.

Persons who have small home outfits for canning in tin will usually find adequate guidance for the canning of most fruits and vegetables in the booklets of directions accompanying such outfits. Since perfectly satisfactory outfits can be purchased at prices ranging from \$6.00 to \$12.00 for water-seal outfits, or \$18.00 up for steam-pressure equipments, most households can easily secure such outfits, but it is quite possible to can fruit with perfect success with an outfit consisting only of a washboiler fitted with a false bottom, a soldering iron or, preferably, a capping steel, a supply of solder and soldering flux, a small brush for applying the flux, and a thick-walled iron vessel for use as a fire pot in heating the soldering iron. A cheap and very efficient machine for sealing the open-top cans without the use of solder or the application of heat has been devised and will shortly be placed on the mar-

THE GOOD JUDGE OVERHEARS THE GARDENERS' CONVERSATION.

BY HECK, I DON'T MIND GRUBBING OUT GRASS ALL DAY IF I HAVE SOME W-B CUT TOBACCO.

SAME HERE. IT'S RICH TOBACCO, CUT FINE, SEASONED WITH SALT, SO A LITTLE CHEW SATISFIES.



IT MAKES a hard-working man glad to have a dime's worth of W-B CUT Chewing in his pocket. A small chew is going to keep him tobacco contented and happy a long time—and he saves himself the labor of grinding, spitting. It's rich tobacco and pays both ways: finer in flavor—more satisfying and it saves money.

Made by WEYMAN-BRUTON COMPANY, 50 Union Square, New York City

Walnuts Most Profitable

Walnuts are now the most profitable crop grown in the Northwest. Our oldest orchard, 4 to 9 years from the graft, will pay 6¢ on a \$1,000.00 per acre valuation this season. The chance of over production is remote as we now import over 40,000,000 lbs. of walnuts annually.

Now is the time to order your trees for fall and spring planting. Our Vrooman Franquette trees have been planted all over the Northwest and are proving their superior quality. They are grafted on selected Northern California black roots with scions cut from our own orchard.

Come before harvest and see the nuts in the orchard, see the fine straight trees in our nursery and the splendid growth made in our new 47-acre orchard planted last spring. To see these things will convince you that our statements are true. Write for our walnut booklet and price list.

GRONER & McCLURE, Hillsboro, Oregon

Fruit Growers Prepare

Your Fancy Fruit Displays and Enter the Grand Competition, both County and Individual, at

Oregon State Fair

Liberal Cash and Trophy Premiums Offered for All Varieties of Fruit are creating unprecedented State-Wide Interest and you cannot afford to miss the opportunity.

Salem, Ore., September 25 to 30, 1916

"Oregon's Biggest Educational Institution"

For Premium List and Entry Blanks, address

A. H. LEA, Secretary, Salem, Oregon



**Oldest Bank
in the
Northwest**

**Established
in 1859**

MANY ADVANTAGES

does this bank offer as a banking institution, not the least of which is prompt, helpful service, absolute security, and a comprehensive knowledge of financial and business matters which is at the disposal of our customers. Your checking and savings accounts invited.

LADD & TILTON BANK, PORTLAND OREGON

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Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital . . . \$100,000.00

4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

Northern Pacific Ry.

THE YELLOWSTONE PARK LINE

USE IT

To CHICAGO To ST. LOUIS
Minneapolis, St. Paul, Kansas City

Elegant through trains daily from Pacific Coast with the
Best Dining Car Service in the world.

TAKE ADVANTAGE OF THE

Low Summer Excursion Fares East

Daily to September 30.



To CALIFORNIA

Have your ticket read

"Great Northern Pacific S.S. Co."

from Portland. The quick and pleasant trip.
Berth and meals included.

HOMESEEKER FARES, low, round trip, **To MONTANA**. Ask about them if interested.

A. D. CHARLTON, A. G. P. A., Portland, Oregon

ket. Full directions for the canning of fruits and vegetables in tin will be found in Farmers' Bulletins Nos. 203, 359 and 426, and in circulars issued for use in the Farmers' Co-Operative Demonstration Work. All of these may be obtained free upon application to the Director, Agricultural Experiment Station, Pullman, Washington.

Fruits canned without sugar by either of the processes above described may be employed in making pies, sauces or for desserts, while fruits, fruit juices or berries may be put up in this way and subsequently used for making jams or jellies later in the season or at the convenience of the household. Many persons prefer that some sugar be cooked with the fruit, and the flavor of some fruits, as for example cherries, is improved by such treatment. If this is desired, the canner who is using the cold-pack method will find it easiest to place the required amount of sugar in each jar before the fruit is packed into it. If the open-kettle method is used, a syrup of the desired strength may be made, boiled for two minutes in a covered vessel, kept hot on the stove and used to fill the cans just before sealing. The amount of sugar used may be determined by the taste or purse of the individual, but the beginner may be guided by the following suggestions:

Extra light syrup, 1 pint sugar (14 ounces) to 2 quarts water; used for peaches, pears, plums, cherries, apples and all berries.

Light syrup, 1 pint sugar to 1 quart water, used for same fruits.

Medium syrup, 1 pint sugar to 1 pint water, used for sharply-acid fruits as sour cherries, currants, loganberries and gooseberries.

Heavy syrup, 2 pints sugar to 1 pint water, used for special purposes, makes what is practically a preserve of the fruit.

The amounts of sugar required to make a light syrup sufficient for canning one bushel of material are as follows: Peaches, 3¾ pounds; loganberries, 6 pounds; raspberries, 5 pounds; blackberries, 4½ pounds; sweet cherries, 5½ pounds; pie cherries, 2¾ pounds; strawberries, 5½ pounds; plums, 3 pounds.

For Rent on Shares

A very fine Hog and Fruit Ranch in Hood River district; everything in first-class order. 100 acres in bearing orchard, 50 acres clover and alfalfa. An excellent opportunity for the right man. Applicants should write, giving full particulars of themselves, their experience and their ability to properly manage the property.

W. J. BAKER
HOOD RIVER, OREGON

Money in Walnuts

By Ferd Groner, Hillsboro, Oregon.

THE question many people are asking at present: Is there any money in walnuts or how soon will they pay dividends, and how much and at what expense per acre before an income is realized? Many do not realize that there is not a grafted orchard in the Northwest older than eight years, but there are many large trees which have been top-grafted from six to nine years that have been bearing heavy, regular crops. The oldest orchard, now eight years, bore 3,100 pounds last season on sixteen acres; about four acres of the sixteen were of a number of varieties planted for experimental purposes and most of the trees bore very few nuts. The bulk of the crop grew on the remaining twelve acres of Vrooman Franquettes and made a net profit of \$36 per acre, the nuts selling for an average of 24 cents per pound. The lowest wholesale price that these nuts sold for to the trade was 22 cents per pound, which is from 5 to 7 cents higher than the average wholesale price of nuts grown in districts where most of our nuts come from. The crop this season is about double that of last year and prices will be fully as high, as the crop in the main nut-producing sections is only about 60 per cent of last year's crop. I think it is safe to state that this orchard will pay 6 per cent net on \$1,000 per acre this season.

In regard to varieties, will say the Franquette is the only one I can recommend of varieties that have been tried out here in the Northwest. We are experimenting with eighteen varieties, ten of which are in bearing; only time will tell their value, but so far none promises to be better than the Franquette. I have a number coming on that I have cross bred, but it takes about ten years to prove one out. As most of the older plantings were undesirable varieties and nearly all seedlings very few proved a success from a financial standpoint. This has had a strong tendency to retard planting as very few grafted orchards are old enough to make a showing. Last season quite a large number of seedling trees were top-grafted to Franquette. Walnuts, no doubt, will be slow in development owing to the high price of good trees, and it takes eight years to prove them out. It took over twenty years for the average farmer to realize the value of red clover which bore a crop the second year. It took over twenty years to introduce kale in Western Oregon and it will take at least ten more years before the average farmer or fruitgrower will realize the value of walnuts.

As walnuts are planted from 40 to 50 feet apart crops such as vetch mixed with wheat and oats, corn, potatoes, kale, pumpkins or peas can be raised on about one-half the ground the first six years without detriment to the trees. If these crops are properly handled more than the total cost of cultivation can be realized before the trees begin to bear.

Notice to Irrigators

California-Nevada-Washington-Oregon

Beginning September 1, 1916, the undersigned is ready to make shipments from its warehouse in Stockton, California, as well as from Denver. This new arrangement will save you time and freight. A convenience for you Pacific Coast farmers who are facing irrigation or drainage ditch problems.

For making and cleaning laterals and ditches no machine is superior to the **Martin** farm ditcher—and there is no equal at the price. Works right or left-handed, in new or old ditches, large or small, in sandy or rocky ground, in gumbo or heavy clay, on hillside or the level, ordinarily with a single team. Cutting blade of crucible steel.

The **Martin** is mechanically simple. No wheels, gears or pinions to wear out and need early replacing. All steel. If you have not received our fully descriptive catalog, ask for it TO-DAY. The **Martin** "costs less than a cow" and on an 80-acre irrigated farm will save the price of *three* cows in a single season. Write RIGHT NOW.

Owensboro Ditcher & Grader Co.

Western Branch

235 Evans Clock

Denver, Colorado



Address All Correspondence to Denver



"BLUE RIBBON"

Bartlett Pears
Elberta Peaches
Italian Prunes

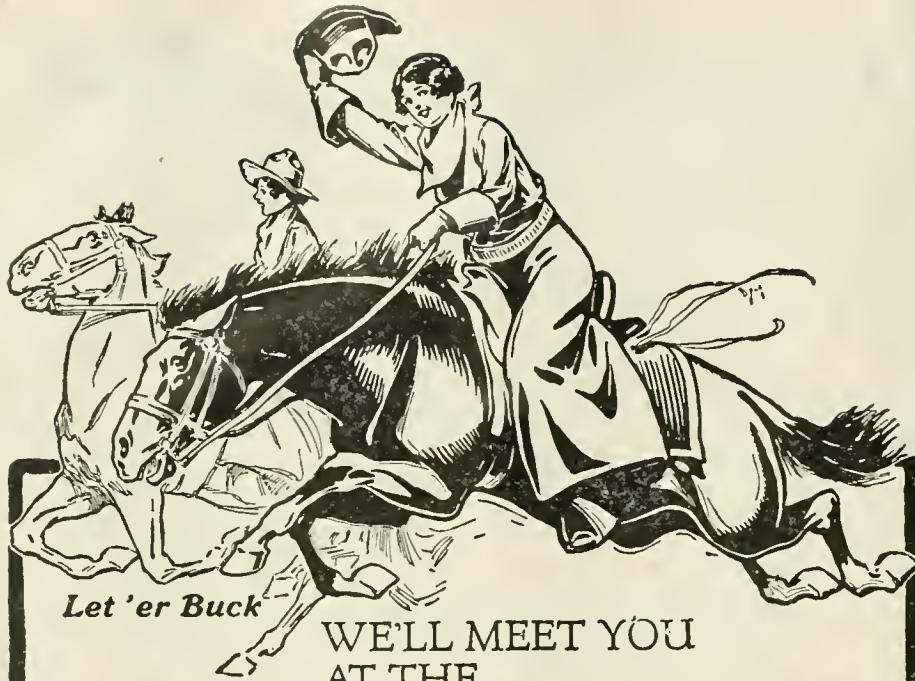
In straight or mixed cars.
All orders given careful and prompt attention.

Wire for Prices.

Yakima County Horticultural Union

FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON



WE'LL MEET YOU
AT THE

ROUND-UP

Cowgirls, cowboys, Indians, bronchos, ponies, wild horses and wild cattle and wild men—all will be there—to play and to thrill with their feats of skill and daring. You who know the Round-up we expect to see; you who do not have our most cordial invitation.

Remember where and when

PENDLETON
SEPT. 21, 22, 23

LOW ROUND-TRIP
FARES **33** VIA THE
O-W R R & N
UNION PACIFIC SYSTEM

Ask the
General Passenger Agent
PORTLAND



Walnuts will not thrive well on wet or shallow soil; foothill, rolling soil is best. They do well on level valley land if well drained. Where drainage is necessary in our orchards we find it advisable to put in the tile about five feet deep. I do not advise planting

fillers, as walnuts do not thrive well among other trees; peaches are especially detrimental. The climate of Southwestern Washington and Western Oregon seem to be most favorably adapted to the growing of such varieties as the Franquette. The Franquette

grown here is of the very highest quality owing to the cool summer weather. Any temperature above 100 degrees for any considerable time will reduce the quality of walnuts. High temperature is the cause of the dark and shrunken kernels in so many nuts found on the market. Walnuts grown in the localities mentioned practically have no dark or rancid kernels, and I have had reports of only one bad nut in a 60-pound sack.

Walnuts have not been planted east of the Cascades so extensively as on the west side, but no doubt many localities will be found where they can be profitably grown. The use of automobiles and auto trucks having greatly reduced the number of horses, the consumption of hay and grain is proportionately reduced. The introduction of new crops should be encouraged, thus cutting down the surplus of these crops, to the benefit of all.

Sugar Beets

THE sugar-beet industry has rapidly grown and has now become one of the prominent industries of California and the Pacific Northwest. There are a number of very large sugar-beet factories. Growers in the neighborhood of sugar-beet factories are making mighty good income on their investment from sugar beets. The sugar is first extracted and lately they have found a use for sugar-beet pulp, using it for feeding stock.

In a few weeks the sugar-beet factories of California will begin slicing this year's crop of sugar beets. This information will be interesting to dairymen and stockmen who are looking forward to a fresh supply of beet pulp. Last year the demand for beet pulp was so great that it was sold out early in the season. The crop of sugar beets is somewhat larger this year than last, and therefore it will bring in a greater profit for the sugar-beet growers, and it is to be hoped that it will be a factor in keeping down the price of sugar. It will also be a help to dairymen because it will help increase the supply of sugar-beet pulp. There

Elderly Men. Your Opportunity.

Many elderly as well as young men are making good money selling our hardy, guaranteed ornamentals, roses, fruit trees, berries, vines, etc.

The prestige of the Washington Nursery Co.—thirteen years in business—handling twelve to fifteen thousand orders annually—insures a hearing wherever you go.

Our field reaches from Montana to Southern California and from New Mexico to Northern British Columbia.

Cash Weekly. Outfit free, experience unnecessary. **We train you free** in salesmanship, landscaping, etc. Best selling season for years. Good business in your own locality. Work all or part time.

WRITE TODAY. If not interested perhaps you know some energetic, intelligent man now unemployed.

Washington Nursery Company
Toppenish, Washington

Largest between the Rockies and Cascades.

has been an enormous increase in the consumption of sugar-beet pulp during the last few years. Consequently it is evident that there must be a good reason for this, which must be that stockmen are finding it to be a very valuable feed.

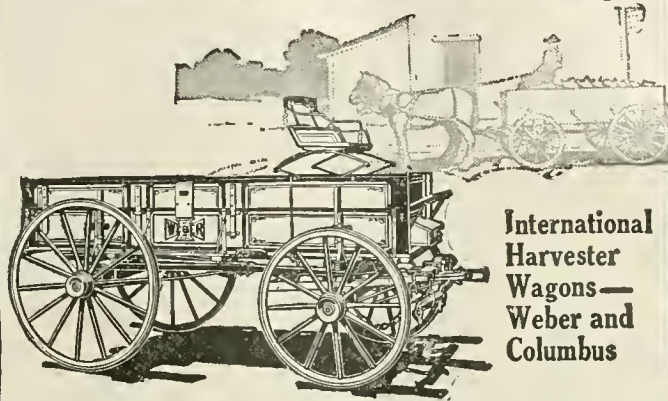
Dried beet pulp is the natural root of the sugar beet, shredded, clean and pure, being the by-product after the sugar and water is extracted. Within an hour after the sugar beets enter the factory, the dry pulp is ready for sacking and loading on the cars. Consequently there is no possibility of its souring in the drying process. When thoroughly dried it will keep indefinitely, just like any other grain or mill feed.

It is stated by those who know that the value of beet pulp lies in the fact that it meets the necessity with stock of a bulky, palatable and at the same time succulent feed, which not only assists in digestion but makes a more complete ration.

In the Western States, beet pulp is fed with alfalfa, making, so it is claimed, a balanced ration, but it can be used with many other combinations of feed. Those who have not fed beet pulp sometimes wonder if it should be fed dry or wet, and this question is frequently asked. It is stated that it is just as good one way as the other. One man says, "Let the cows decide it for themselves. They'll soon tell which way they like it best." First try feeding it wet. If soaked beforehand the actual amount of water in soaking it is immaterial. You will probably find at first that cows like it better wet than dry. However, when they become accustomed to it, men of experience say you can gradually switch a cow to dry beet pulp, if you think it advisable.

The quantity to be fed is another question of importance to the dairyman and stockman. Of course this is a question each feeder should determine for himself by keeping a record of what each cow would naturally consume or require. However, men of experience state that an average cow of about 1000 pounds weight, giving 25 to 30 pounds of milk daily, can be fed from 8 to 10 pounds of beet pulp, weighed dry, with a ration of about 18 to 20 pounds of alfalfa hay, or about as much hay as a cow will naturally require. They say that beet pulp should be fed first and divided into two feedings daily. Dried beet pulp contains about 65 to 70 per cent of digestible carbohydrates, and this ration as recommended would mean approximately 2½ pounds of digestible protein and about 14 pounds of digestible carbohydrates, which is normally about the amount of nutriment required by the average dairy cow. If alfalfa hay cannot be obtained at a reasonable price, it has been suggested that it would be necessary to feed cottonseed meal or some other protein feed along with the beet pulp. It is also suggested that it might be wise to displace one or two pounds of beet pulp with an equal amount of grain or mill feed for the sake of variety.

More for Your Money



International
Harvester
Wagons—
Weber and
Columbus



YOU can be sure of one thing when you buy a **Weber or Columbus wagon**—You get more service for your money. The good service they give is one of the strongest features of **Weber and Columbus** wagons. This service is the result of careful design and construction, such as is shown in the **International fifth wheel**.

Look between the front axle and bolster, where the king bolt goes through. There you will find the fifth wheel (an exclusive feature). Note the wide circular wearing surface of the two substantial fifth wheel plates. Those plates relieve the owner of a lot of trouble. They prevent breaking or bending of circle irons. They prevent the pitching of the bolster that breaks or bends king bolts. They take strain off the reach and keep the lower part of the front axle from sagging.

This one feature adds years to the life of the wagon, but, better even than that, it indicates the care and thought that have been given to every **Columbus and Weber** feature, and they are many.

Look over the **Weber or Columbus** wagon carefully, either at the local dealer's place or in the illustrated wagon folders we will send you on request. Then you will see why, if you want more for your money, your next wagon should be a **Weber or Columbus**.

International Harvester Company of America
(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
San Francisco, Cal. Spokane, Wash. Salt Lake City, Utah

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly

SEND FOR BOOKLET

Arcadia Orchards Company

Deer Park, Washington

PORTLAND, OREGON

Portland Hotel

The hotel which made Portland, Oregon, famous.
Most Desirably Located. In the Center of Shopping and Theatre District.
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets

European Plan—\$1.00 per day and upward

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

NEW CROP—

SEEDS

FOR FALL SOWING

Vetches, Alfalfa, Clovers, Grains, Grasses

SELECTED RECLEANED FARM and FIELD SEED
AT LOWEST MARKET PRICES.

SPECIAL MIXTURES FOR WET LAND
— DRY LAND — BURNS — PERMANENT
HAY CROPS AND PASTURES.

Cover Crops for Orchards — Dry Land Pasture Mixtures

OUR SEED LABORATORY is in charge of a skilled analyst and all "DIAMOND
QUALITY" Seeds are TESTED for PURITY and GERMINATION

WRITE TODAY FOR SAMPLES

Or send in your order direct. We guarantee full value for the
money sent and will give your inquiries our prompt and careful attention

NOTE THEIR
PURITY and WEIGHT

Ask for Catalog No. 200

PORTLAND SEED

COMPANY

PORTLAND, OREGON



F. W. BALTES AND COMPANY

Printers · Binders



Unexcelled facilities for the production of Catalogues, Booklets, Stationery, Posters and Advertising Matter. Write us for prices and specifications. Out-of-town orders executed promptly and accurately. We print BETTER FRUIT.

**CORNER FIRST AND OAK STREETS
PORTLAND, OREGON**

These suggestions are given with the idea of giving the dairyman or stockman a little general information about beet pulp as a feed for the reason that a great many fruitgrowers are going into the dairy business, and it has been found that those who have used beet pulp have found it a very desirable feed.

Bartlett Pears

The Bartlett pear is the greatest pear, in a commercial sense, of any pear grown. It is one of the best eating pears, commanding a good average price, always being in demand at the canneries at remunerative figures. The Bartlett pear has been grown extensively in California for many years, especially in the Sacramento Valley. Originally nearly all of the pear orchards in Northern California were set in the flat land. Now a great many orchards are being set out in the mountainous districts, like around Red Bluff, Redding and Grass Valley. Grass Valley has gone extensively into Bartlett pears, where it is stated they reach a very fine quality, the growers meeting with splendid success. The Bartlett pear is one of the best all-around pears, year after year, that a grower can plant.

Don't Forget!

The established fruit auctions of New York, Philadelphia, Boston, Pittsburgh, Kansas City and a few of the other large cities have set the price upon the cherries and pears of the Pacific Northwest.

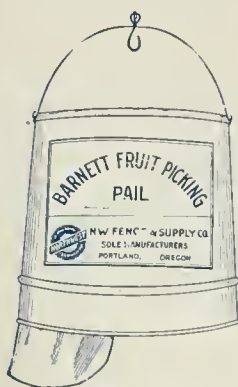
Every box bought f.o.b. shipping point and every box sold upon delivery at any of the small markets where there are not these standard "clearing-house" auctions have had a price based directly upon those of the fruit auctions.

To those who fear that selling apples at auction will prevent f.o.b. buying, this season's experience in itself is an answer. Compare the number of f.o.b. buyers of these auction-sold commodities with the lessening number of those who buy apples f.o.b. shipping point.

Everybody has a chance to speculate in auction-sold commodities. Dozens of firms have placed funds in Western banks and, as each quota of cars arrived, have wired back more funds to buy more cars. Prompt returns from the auction companies have enabled this.

The box apples that are not sold at auction will not have the same enthusiastic support of the whole trade of the largest cities. Except for the few large jobbing and commission houses, through whom the associations and other shippers deal, the trade will be composed of "Bears," who will not speculate or boost the sales of box apples. Nine out of ten of the firms will buy from the apple operators as they receive orders for them and no faster. They will not boost "another man's game."

[Adv.]



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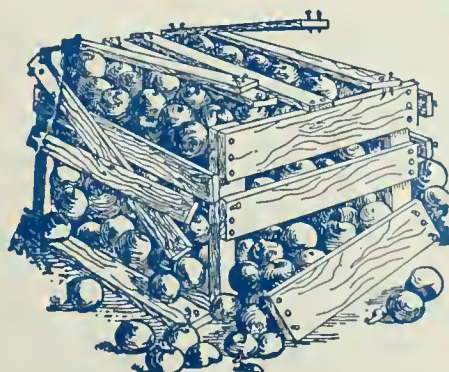
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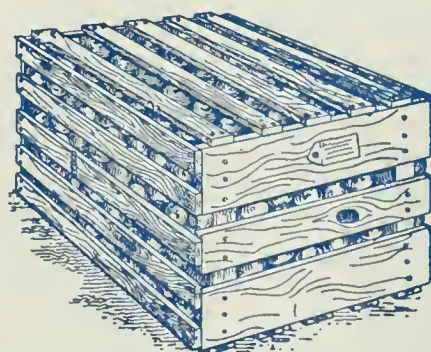
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

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AND OTHER FRUITS

OUR MARKET—
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BETTER FRUIT

VOLUME XI

OCTOBER, 1916

NUMBER 4



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Ask us the name of the nearest Mitchell dealer, if you do not know him. For your own sake, see the car he has. (122)

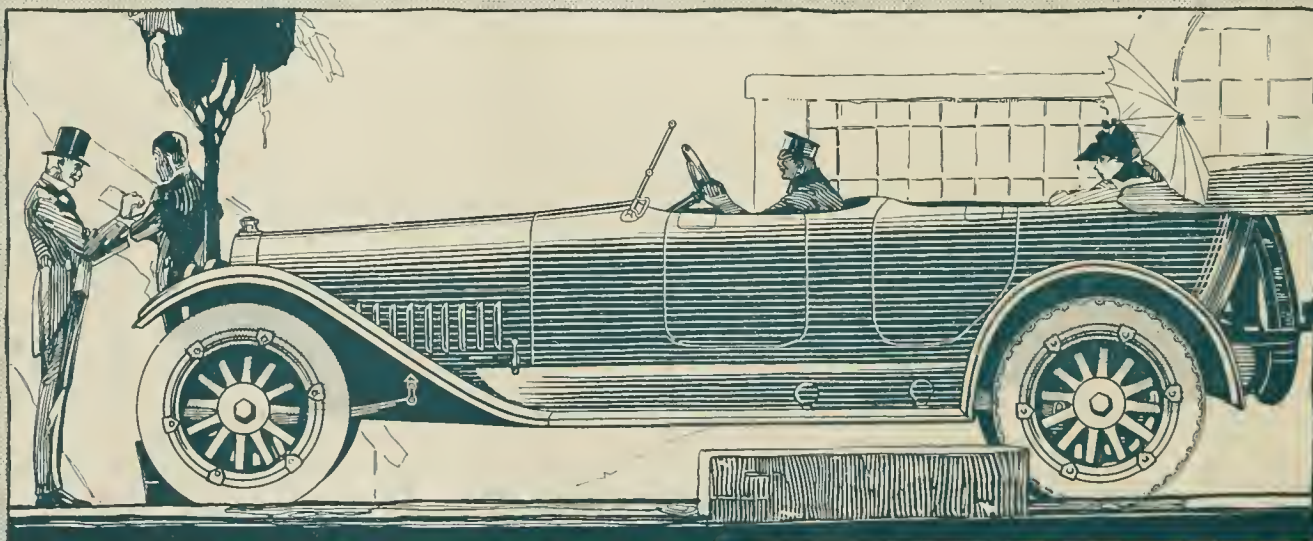
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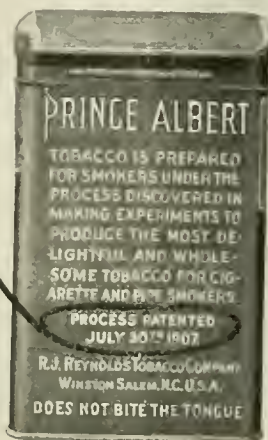
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The Physical Handling of Fruit

By C. I. Lewis, Professor of Horticulture, Corvallis, Oregon

MOST fruit growers of the Pacific Northwest are now familiar with the fact that the Office of Markets of the United States Department of Agriculture spent much time studying our fruit marketing situation in the Northwest, and finally suggested to the growers that they form what has been termed the Fruit Growers' Agency, Incorporated. It is not my purpose to deal with the entire function of this new agency, but more to confine myself to its relation to the physical handling of fruit in the Pacific Northwest. This function of the Fruit Growers' Agency, Incorporated, is well defined in what is known as the uniform contract. In this uniform contract, under Heading 2, Section b, we find the following: "(b). To work in close harmony with growers with the aim of securing uniform methods in the harvesting, grading, packing, and the physical handling of the fruit from tree to ear; and to secure a standardization and enforcement of the grading and inspection rules of the States of Oregon, Washington, Idaho and Montana." Also under Heading (g), No. 2, we note the following paragraph: "To see that the fruit is prepared for market so that the grade and pack may be in accordance with the best trade demands."

The reader will see at a glance that these two clauses indicate that a vigorous campaign is to be waged in the Pacific Northwest to improve the physical handling of our fruit. In Oregon, the Oregon Agricultural College, thru its Bureau of Markets, is co-operating very closely with the Government in the general program, and the Division of Horticulture is giving aid in the physical handling of fruit.

In addition to the work which the Office of Markets and the various Agricultural Colleges in the Northwest are doing to foster this movement, other United States Department of Agriculture agencies are aiding the growers at this time very materially. I refer especially to the investigators connected with the Office of Pomological Investigations, who are conducting in the Northwest investigations on the pre-cooling and storage of fruit, the construction of packing houses and storage plants, etc. These men are ever ready to co-operate with the growers in giving assistance along such lines. The Office of Markets has not confined its energies to the mere organization of such an agency, but it has placed numerous men in the field to help carry out the various provisions of the "uniform contract." Along the lines of physical handling, it is interesting to know that

men are at work in the Pacific Northwest studying our methods of packing and transportation. A special study is being made of community packing houses, and their general efficiency, as compared with small houses conducted by independent growers.

Never in the history of Northwest fruit growing has so much attention been given to the problems of organization and of marketing our fruit. Never before has our national government lent us so much aid. Not only the national government and the agricultural colleges, but our business men are backing this movement. It is gratifying to note that our substantial business men and bankers at last realize that much attention must be given to our two-hundred-million-dollar apple industry, and feel that they must assist in marketing so that we may realize the greatest profit from the industry.

It is very important that we give this subject of physical handling a very close study. It is true that the Northwest has perhaps made more progress in the grading and packing of fruit than any other section of the world. We have become famous because of the quality of our pack, but perhaps this reputation in a way is beginning to hurt us. We are resting on our oars. Many of us do not realize the terrific loss that our growers are sustaining because our methods are not what they might be. We have only started in this great work; we are beginning to learn that

our fruit must be moved much more rapidly than formerly; that we must make a supreme effort to get this fruit from the tree to the cold storage plant in the shortest possible time; that unnecessary delay means that we will suffer enormous losses. We are just beginning to realize that we have been wasting too much money; that we are on the threshold of a period where more waste will be the result unless we study this question more in detail. We are about to spend millions of dollars in the erection of packing houses and storage plants, and before this money is spent we should analyze the situation carefully. We have passed through our period of development; we are now reaching a period of organization, not a mere selling organization, but an organization of standardization of methods of physical handling. We can learn a great deal from each other, and by co-operation can do much to improve the condition of our fruit, as far as its arrival at the point of consumption is concerned. We must maintain finish in our fruit. We in the West are favored because of the superb color and quality of our fruit. Our growers have demonstrated that this can be fairly easily obtained. We have not demonstrated, however, that we can always put this fruit in the hands of the consumer with the same degree of finish. While we are putting lots of it there with finish, a very large percentage is arriving at the market in poor



FIGURE 1—Packing scene in house in Hood River. Shows cheap construction and good light. The fruit is placed on sizer at upper end of room.



FIGURE 3—Fruit being unloaded on upper floor. Note fruit is being placed on gravity carriers. The wagon used is a good type and the tarpaulin on it aids in keeping the fruit clean.

condition. Our problem is to see if we cannot handle our fruit in such a way that the consumer can get the benefit of the superb quality and finish, and second, that we put this fruit in his hands at a lower cost than we have formerly been able to accomplish.

Harvesting.

There are two conclusions that students of the methods of harvesting in the Northwest will invariably come to; first, that we don't pick enough of our fruit at the right time, allowing a very large percentage of it to become over-mature, and second, that we allow too much delay between the time the fruit is harvested and the time it is packed. While some of our fruit is picked too green, resulting in poor quality and a development of storage scald, nevertheless a very large percentage of our fruit stays on the trees far too long. This is due to the fact that our growers are over-anxious to obtain the maximum amount of color. Though the writer can remember when the Jonathan apple on the whole was picked from ten days to two weeks later than is now the practice, nevertheless far too many Jonathans are today allowed to remain on the tree too long. There is an enormous amount of deterioration which takes place in our fruit owing to this delay in harvesting. For example, many apples develop a sort of core rot. This is especially noticed in such varieties as the Jonathan, Delicious, Gravenstein and Ortley. Many varieties develop a dryness and mealiness of flesh, lack of juice, and are devoid of real snap and high quality. This is found very commonly in such varieties as Spitzenburg, Jonathan, Baldwin, Delicious and Wagener. In fact, nearly all of the fall and early winter varieties are subject to this deterioration. A splitting at the calyx is very pronounced, and is not confined to any one variety, but is found prevalent in nearly all varieties. This calyx

cracking and splitting at the stem is almost invariably due to an over-maturity of the fruit. In many red apples a noticeable black pitting is found in the flesh. There is a slight depression in the skin, which becomes black. This is especially noticeable in the Spitzenburg, Jonathan and Baldwin. The length of the keeping season of many of our apples is greatly reduced because of this delay in harvesting. The writer once carried on some experiments with fall and winter varieties along these lines, and it was found that by picking at the right time many fall varieties could be carried well into the winter, while with the late keepers, such as the Yellow Newtown, two months' difference in the keeping quality was the re-

sult of a period of a week to two weeks' difference in the time of harvesting. With many of our apples it is going to be necessary to have several pickings. This is especially noticed in the Gravenstein, and will be especially true in fall and early winter varieties. The Jonathan, for example, could often be picked to advantage with several pickings rather than a single picking, if we keep in mind the highest quality of the fruit. In College Bulletin 118, entitled "Handling the Fruit Crop," the writer has given the characteristics of many varieties, which might aid the grower in determining the proper time for harvest. In that bulletin also he has discussed many subjects on packing and harvesting which will not be repeated here.

We need to organize our harvesting more than we have done in the past, to have a proper division of labor between the pickers, graders and packers. The day is coming when we are going to follow quite closely the footsteps of many of the orange growers. We will be organized into groups, associations or organizations of various kinds, where all the equipment will be held and owned by the organization, and such organization, whether it be a fruit growers' association or corporation, will have absolute control of the harvesting, will take charge of the same, and the grower will simply become one of the community workers in the general scheme. In other words, we are drifting very rapidly to the community idea in handling our fruit, and what progress we have made seems to indicate that the movement is a wise one, which will result in an improvement in methods and a standardization that we can perhaps accomplish in no other way.

The fruit is allowed to remain in the orchard far too long after it is harvested. While many growers make the attempt not to allow the fruit to remain



FIGURE 4—Fruit coming into temporary storage room on a gravity carrier. Man in background is unloading from wagon.

over twelve or fifteen hours, still it is not uncommon to find fruit stacked up in the orchard for several days. Some growers argue that it is better to haul in the fruit during the cool of the morning, after it has been thoroughly cooled. The greatest objection offered to this practice is the accumulation of dew, which makes the fruit very wet and undesirable to handle until later in the day, when the fruit again becomes heated. In some sections they are trying the experiment of night hauling. The fruit is picked during the day, and in the early evening and during a good part of the night the fruit is hauled. To bring this about motor trucks are often used. It seems possible in many communities to secure trucks that have been working in the cities during the day time, and are generally idle all night. These truckers are quite often glad to have their machines at work during the harvest period. Mr. E. V. Beckwith, manager of the Rogue River Fruit and Products Association, has hauled fruit fourteen miles to his community packing house, using for such purpose the auto truck. We must make an honest endeavor to get our fruit from the orchard to a place where it can be cooled and kept cool in the shortest practicable time.

Grading and Packing Equipment.

In choosing the equipment for a house, rapidity, efficiency and economy must be sought. As is true in commerce and manufactures, effort must be made to reduce hand labor to the minimum. Not only must there be good equipment, but it must be so arranged that it allows for speed, system and lack of confusion. The indications now are that the days of hand sizing and of much trucking are past. The fruit grader, or what had better be termed the fruit sizer, and the gravity carrier have come to stay. While there are some growers who feel that

the fruit sizer is not what it is represented to be, the great majority of growers in associations in such districts as North Yakima, Spokane, Watsonville and Hood River, who have tried them, speak of the machine in highest praise. From present indications a very large percentage of the fruit in the Hood River Valley this year will pass through mechanical sizers. The hand-sized fruit will be the exception, and the machine-graded fruit the rule. In all probability some of the dissatisfaction that has come from the use of fruit sizers has come from the fact that old models have been tried. The fruit-grading machine manufacturers have benefited

from four or five years' experience, until now most of the machines have been greatly improved and the later models seem to be giving very good satisfaction. There are many models of machines on the market. Some grade according to size, but the present tendency with most machines is to grade according to weight. Nearly all the machines will give at least two grades, and some will grade three at the same time. Where only two grades are carried through the machine at the same time, the practice is to run the remaining fruit, which would make C grade and cookers, through the machine on a second run. There are some half dozen machines being used in the Pacific Northwest and California, and the manufacturers will be very glad to furnish readers with testimonials of their efficiency. The writer has obtained letters from users of practically all of these machines. These machines are the Cutler fruit sizer, the Nuna-maker grader, and the Palmer grader, all of Hood River; the Oregon apple sizer, of The Dalles; the Price sorter and sizer, of North Yakima, and the Nelson grader, of North Yakima. Those who have used the machines extensively claim the following advantages: First, that much cheaper grading and packing results. For example, where packing from hand-sized fruit usually cost as high as six cents a box, much of the machine-sized fruit can be packed at as low a cost as three cents. Second, the machine is much more rapid. Where formerly a grower packed from 50 to 75 boxes a day, he now packs from 100 to 125 boxes. The use of the machine has often allowed the grower to get along with such makeshifts as tents for use as packing houses. It has also meant that much less room for temporary storage of fruit before it is graded is required with machines, than where hand grading is resorted to. Again,



FIGURE 8—The fruit which was placed on chute by the man in Figure 7. Note that the fruit is being carried directly to wagon from packing room shown in Figures 5, 6 and 7.



FIGURE 6—This shows a well proportioned room—plenty of space, not too much and not too little. This means economy. Note the good use of gravity carriers. This view will also give a good idea of the type of construction of this building.



FIGURE 5—Fruit being graded and packed. Men to the right are grading. Men in the rear packing. Note apples in the air being thrown by machine. Also note fruit is brought to graders on a gravity carrier.

where help is scarce, it allows you to use more pickers in the orchard, and less packers in the packing house to handle your crop. A great many growers have sent testimonials regarding the use of the sizer. Some of these will be of interest to our readers.

Mr. C. A. Reed, a prominent grower of the Hood River Valley, has the following to say concerning his experience with the grading machine: "Machine grading has cheapened the cost of handling considerably. In 1913, the last year I packed without a machine, it cost me approximately 16 cents a box to handle through the packing house. In 1914, the first year I used a machine, it cost 10 cents, and in 1915 the cost was 8 cents. In 1915 the labor was 25 cents a day cheaper than in 1913 and 1914. Packing in 1913 cost me 6 cents per box, in 1914, 4 cents, and in 1915, 3 cents. A machine does increase the amount of work a packer can do. The machine just about doubles the amount of packing. The machine I think is the best is the Cutler. I have their 1914 model. Their 1915 model is a very good one."

The Pioneer Packing House of Hood River, a community packing house to which reference will be made later under the subject of community packing houses, reports that a Palmer sizer

with attachments for handling three grades at once has proved itself to be a great economy in handling fruit.

Mr. MacDonald of Watsonville, California, has the following to say concerning the use of the grader in their warehouse: "Answering your favor of the 24th, we beg to advise that we are using the Price fruit grader, both in our packing house at Watsonville and also at Aptos. We find the use of the grader most satisfactory in the handling of apples. Not only has it improved our pack for the reason that our apples are graded perfectly as to size, but it also enabled us to do the work far cheaper. The saving in labor, however, varies a good deal with the amount of culls that are to be sorted out before the fruit reaches a grader. On our first picking of Bellflowers last season we were making a saving of \$10.30 a day by the use of graders, as against the old way of hand sorting and grading."

Mr. Rogers, of Rogers Brothers, Watsonville, also has some very favorable comments regarding grading machines: "Before using the machine we had only three main sizes, namely, 3½ tier, 4 tier and 4½ tier. It is our opinion, however, that by using the machine we are able to get better grading and better sizing; also quicker and cheaper handling. We estimate that it will cut down the expenses per box from 2 to 5 cents over the old methods."



FIGURE 7—Fruit being nailed at end of sizing machine. Note man in rear placing box of fruit on chute.

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Every fruit grower will find valuable information in the Giant Book, "Better Orchard Tillage," written to suit Pacific Coast conditions. It tells and shows how to plant trees and subsoil orchards in the most effective way. This handsome book—or others—free. Mail the coupon.

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U. S. BULLETIN No. 38.

"I have seen orchards in Hood River greatly benefited by the use of dynamite, where the dynamite opened up the soil to give better drainage."

C. I. LEWIS,
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"The soil is the pasture in which the roots of the tree feed. Blasting enlarges the root pasture, breaks up the hardpan and subsoil and permits the roots to go down and get plenty of food."

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Send me your illustrated books on the subjects which I have marked X:

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Through the microscope, a strap looks more like a sponge than a piece of leather—it's honey-combed with pores. Through these pores, dirt, sweat and moisture attack the leather fibre and weaken your harness.

EUREKA Harness Oil

fills these pores—preserves the original strength and appearance of your harness—adds years to its life. Ask your dealer today.

Standard Oil Company

(California)

The Corralitos Fruit Growers' Association, of Watsonville, states that the association installed five Price fruit graders the past season, and were able by the use of these to reduce greatly the cost of handling the fruit, as well as to put out a much finer and more uniform pack.

We have dozens of such testimonials which show the value of these machines. All machines enumerated have had kind words said in their behalf. There is no attempt on the part of the College to recommend one of these machines over the other. It would simply call the growers' attention to the fact that these machines are on the market, that they are giving efficient service, and that our readers can avail themselves of the opportunity to investigate by writing to the manufacturers and getting the names of growers who have used their machines, or they can attend

the numerous state fairs and apple exhibitions and see these machines working. We feel confident that in the very near future nearly all the fruit in the Pacific Northwest is going to pass through the mechanical sizers.

Many of the fruit packing houses are finding that the gravity carriers or conveyors are proving to be great money-savers. They do away with much trucking, help to systematize the handling of the fruit, and aid in the rapidity of handling. These gravity carriers come in many forms, such as a series of rollers or carriers, inclined planes or conveyors, and chutes which take boxes from floor to floor. They can be used first to take the fruit from the wagon as it is hauled to the house, and later to the grading machines. Another carrier takes the packed fruit from the machine to the nailer. From there it is placed on the carrier again and taken to the

storehouse. From the storehouse it can be taken on a carrier right into the car where it is loaded. Additional conveyors can also be used to take the empty boxes from the grading machine to various parts of the house, where they can be stacked ready for the fruit growers. Various chutes can be constructed to enable one to secure the boxes for packing easily from the attic or loft. The Hanauer-Graves Company, of Spokane, Washington, have two houses that are splendidly equipped with these conveyors. One of their houses is known as The Meadow Lake - Waverly Holding Company. Mr. A. E. Peters of the Hood River Apple and Storage Company has installed such conveyors in the company's packing house, and finds them of great value and aid in the work.

Every packing house which handles a large tonnage should have efficient nailing machines. There are still too many houses which have rather cumbersome machines for the nailing of the boxes. The time may come when we may be able to nail our boxes mechanically; at least, the time is not very far distant when in the larger community and association houses it will probably pay to install box machines for the manufacture of the boxes for packing, or for field boxes to be used in the orchards. The small individual grower cannot possibly afford such machinery, but where thousands of boxes are to be used it will pay the managers to investigate the possibilities of such machines.

The writer is not attempting in this bulletin to give a complete analysis of the cost of handling the fruit crop. Such a report has already been given in Station Bulletin 132, entitled "The Economics of Apple Orchard." That bulletin gives the cost of harvesting and handling the crop from a thousand orchards in the Northwest, and is available for distribution to those growers who desire it. The figures in that bulletin indicate that the average cost of handling the crop, including the picking, packing, hauling and cost of materials required, ranges from 30 to 35 cents. However, in the larger houses, and in many of the community houses, figures of from 4 to 9 cents a box less than these have been secured. In fact, there is one community house that, it is claimed, puts up a good pack for as low as 24 cents. There are certain varying factors which will determine the cost, such as tonnage, arrangement of building, business management, etc. One fact stands out very clearly, however, namely, that the average is too high. We know this because those growers who have taken the average of the Northwest and have worked carefully for a few years have generally been able to reduce the cost of handling from 4 to 8 cents a box in a period of two or three years.

Continued in next issue

Fruit buyers pay better prices for apples in clean orchards; they can see the fruit. Its quality shows up. It looks easy to handle. The man with a neglected orchard never gets what his fruit is worth.

OUR SPECIALTIES

BOX APPLES and the PEACHES PARS RUNES

We handle more box apples that any concern in Ohio and want to hear from every grower and shipper who will have either large or small lots to offer.

Let us hear from you at once.

I. N. PRICE & CO., CINCINNATI, OHIO

REFERENCES: ANY BANK OR CREDIT AGENCY

1916 Fruit Crop Estimate for Washington

[Horticultural Division of State Department of Agriculture in co-operation with the Fruit Growers' Agency.]

IN making the estimates and collecting the data for this report the inspectors at large were instructed to look over their horticultural districts preparatory to making their estimate and to call on shippers and shipping organizations accustomed to making fruit crop estimates. In this way we have the opinions of many different shippers in addition to the inspectors as to the fruit crop prospects.

Miller, Cashmere, local horticultural inspector; Ira Cleveland, Wenatchee, Growers' League; William Humphrey, Wenatchee, Growers' League; Cliff. White, Cashmere Union; Harry Upker, Wenatchee Produce Co.; Pickett & Andrews, Cashmere; R. Garritson, Brewster; F. H. Phipps, Brewster; Pat Ryan, Bridgeport Bar; Nels Darling, Bridgeport; C. A. Thomas, Bridgeport, and others.

Shipping Point	Apples	Peaches	Pears	Plums	Apricots	Cherries
Leavenworth	40	...	...	...	...	...
Peshastin	215	...	2	...	...	...
Dryden	300	...	20	...	...	...
Cashmere	1,500	...	80	3½	2	5
Monitor	600	5	40	5	10	4
Wenatchee, Olds and Malaga	3,100	100	200	80	150	65
Ential	400	19	20	3	2	...
Winesap	40	...	...	...	...	...
Chelan	200	...	4	...	...	...
Pateros	105	5	4	...	...	4
Brewster	175	3	2	...	1	1
Okanogan-Malott	150	3	4	...	2	...
Omak	485	...	4	...	3	...
Totals	7,310	134	380	90	170	79

Of the two and one-half million boxes handled in 1914 by "The Big Four" the inspector has figured out what part of the total crop was Winesaps, Spitzenburgs, Jonathans, etc. On this basis the inspector has made the following estimates for the 1916 crop:

Variety	Per cent in 1914	Per cent in 1916
Winesap	19.6	20
Jonathan	16.8	16
Delicious	2.9	6
Spitzenburg	11.0	13
Rome Beauty	8.8	9
Stayman	8.5	9
White Winter Pearmain	2.2	3
Yellow Newtown Pippin	2.1	2
Black Ben and Gano	7.0	7
King David	1.3	0.05
Winter Banana	0.8	2
Black Twig	2.0	2
Ben Davis	4.1	3
Arkansas Black	2.3	2
Grimes Golden	1.2	1
Mixed	7.8	6

The above estimates were submitted to this office by Mr. O. T. Clawson, inspector at large, Wenatchee, Washington. The following men assisted Mr. Clawson in getting the information and in making the estimates for the North Central Washington district: Clois George, Brewster, local horticultural inspector; Stanley Nagley, Okanogan, local horticultural inspector; Harry E.

Yakima Valley.

Estimated that Kittitas County will produce 250 cars of apples this season.

An average of the different estimates for Yakima County gives us the following figures: Apples, 6,595 cars; pears, 752 cars; peaches, 834 cars; plums and prunes, 130 cars. Some of the estimators placed apples as low as 4,500 cars, while one estimate was as high as 8,000 cars. The majority of those estimating gave figures ranging from 5,500 to 7,000 cars, so that the average of the different estimates looks conservative.

In submitting his estimates the inspector at large also comments on some factors affecting the condition of the crop:

Aphids—The past two weeks have been cool, cloudy and rainy, and as a result the aphids have become very plentiful, and in our travels over various parts of the valley we find that the aphids are causing considerable loss, in fact we have reduced our apple estimate 100 carloads. If the same weather conditions continue for another week we shall have to reduce our estimate at least 200 carloads. A small percentage of the apple growers have been spray-

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We will make reasonable advances on suitable varieties and quality for our high class trade.

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Ask your banker about our standing if you don't know us.

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The Merchants' Cold Storage Co.

CAPITAL STOCK, \$200,000

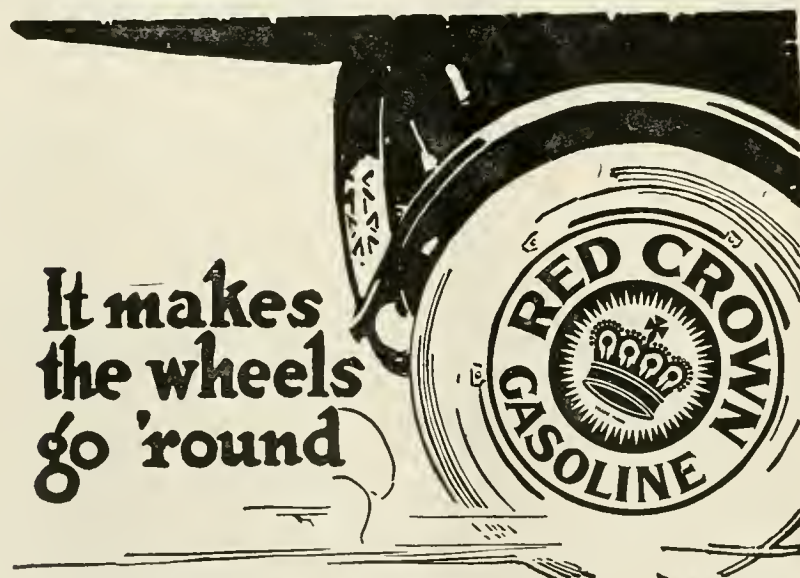
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ONE HUNDRED CARS OF RED APPLES

for our Southern and Export Trade

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NEW ORLEANS, LOUISIANA

ing for the aphids, but the majority have not on account of anticipating hot weather.

Apple Powdery Mildew—There has not been as much spraying for apple powdery mildew as during the previous year, yet the disease has been worse in some parts of the valley. Many apples will be put in the C grade which otherwise might have been put in the higher grades, had the growers sprayed.

Codling Moth—The growers in general are doing better spraying and seem anxious to apply the spray at the proper time. We advised an intermediate spray beginning June 27, to July 4, and many are spraying. We find two distinct stages of codling moth larva. The older worms are just emerging from the apples and the younger stage just entering, so you can see what we may expect during July and August.

June Drop—The June drop has been very heavy and especially so in those orchards that were hit hard with the late frosts. We have lowered our estimate about 300 carloads on account of the June drop.

Fire Blight—This disease seems to be gaining headway all over the valley, partly on account of weather conditions and aphids and carelessness on the part of many growers. The Grandview, Buena, Parker Heights and districts adjacent to the city of North Yakima are becoming generally infected.

The fruit crop estimates for Kittitas and Yakima Counties were submitted to this office by Mr. F. E. De Sellem, inspector at large, North Yakima, Washington. The following men gave Mr. De Sellem assistance in making the estimates for these two counties: H. E. Waterbury, local horticultural inspector; C. L. Hamilton, field inspector, Yakima Valley Fruit Growers' Association; C. W. McCullough, sales manager, Yakima Valley Fruit Growers' Association; Horticultural Union, Richey-Gilbert Company, Shrader Company, Refrigerator Companies, Growers Service Company, E. E. Samson Company, Thompson Fruit Company.

The estimate for Benton County is as follows: Apples, 160 cars; pears, 80 cars; peaches, 40 cars. These estimates were submitted by Mr. Luke Powell, inspector at large, Prosser, Washington.

Walla Walla District.

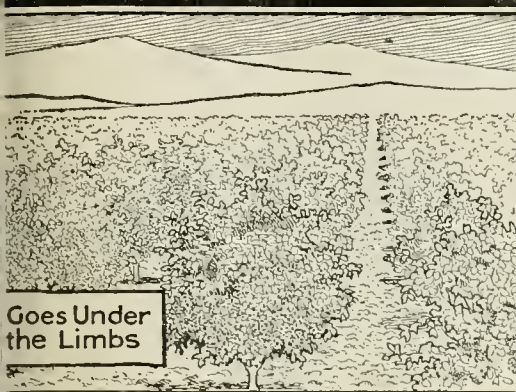
For Walla Walla and Columbia Counties the following car-lot estimates were carefully made and are considered very conservative estimates of the apple crop: Winesap 40 cars, Rome Beauty 190, Newtown Pippin 30, Jonathan 75, Arkansas Black 6, Grimes Golden 5, Ben Davis 25, Black Twig 13, Baldwin 3,

TRAPPERS WE BUY FOR CASH

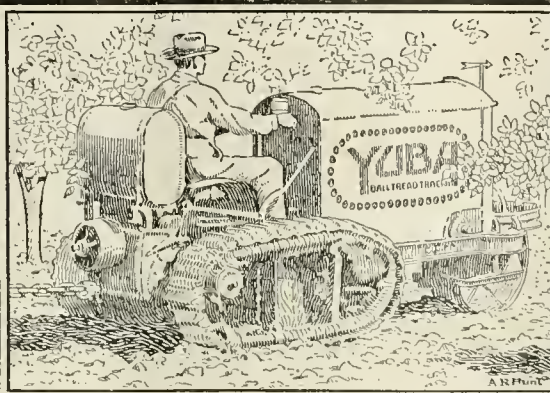


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TRACK: Tread shoes of cast steel—without bolts. Pins and bushings are renewable. The races are of manganese steel.

TRACK DRIVE: Through manganese pinion that meshes directly with the chain. This pinion is completely enclosed and protected from wear.

AIR CLEANER: Equipped with a Donaldson Air Cleaner, which is almost 100 per cent. efficient in removing harmful dust from air that enters the carburetor.

TRANSMISSION: Of the sliding gear with three speeds forward and one reverse. Direct drive on all three

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DIMENSIONS: Over-all width, 55 inches. Length, 12 feet, 3 inches. Height, 4 feet, 6 inches.

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WEIGHT: 6200 pounds.

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Name	CHECK MAIN CROP RAISED
P. O. Box	Fruit..... Rice.....
Town	Grapes..... Alfalfa.....
State	Grain..... Hay.....
Size of Farm..... acres	Hops.....

Wolf River 7, Banana 3, York Imperial 4, Delicious 4, King David ½, Bellflower ½, Northern Spy 2, Kaighn Spitz 4, Wealthy 2, Snow 1, Duchess 7, Northwestern Greening 1, Wagener 1, Jeffrey 3, Gravenstein 4, Virginia Beauty 2, Astrachan 1. Total 434 cars.

For Garfield and Asotin Counties the estimate is: Pears 12 cars, peaches 35, Rome Beauty 50, Spitzenburg 8, Winter Banana 1, Jonathan 2, Ben Davis 2, Winesap 1, Stayman 3, Yellow Transparent 2, Duchess 2.

The fruit crop estimates for the Walla Walla district were submitted to this office by Mr. C. W. Gilbreath, inspector at large, Walla Walla, Washington. In making the estimates for Walla Walla and Columbia Counties Mr. Gilbreath was fortunate in being able to decide upon final estimates in conference with Captain Paul H. Weyrauch, president of the Fruit Growers' Agency. C. G. Andrus and Stanley Armstrong assisted Mr. Gilbreath in the estimates for Garfield and Asotin Counties.

Spokane District.

We have the following report from the Spokane district: "On account of scattered orchards and amount of new

acreage coming into bearing it is hard to estimate the crop. Probably 1,000 to 1,200 cars of apples and 100 cars of mixed fruit shipments. June drop has been heavy. Practically no hot weather yet. H. W. Samson, Inspector at Large, Spokane."

Clarke, Skamania, Klickitat Counties.

Clarke County—The estimate of 7,000,000 pounds of dried prunes remains as the estimate, as there seems to be no reason to date for changing this former estimate.

Skamania County—Apple crop estimated at 15,000 boxes.

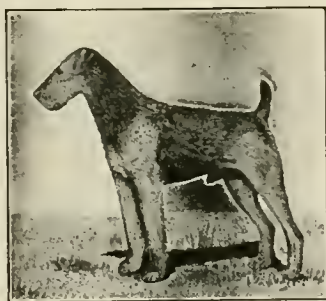
Klickitat County—Apple crop estimated at 86,000 boxes, pears 5,000 boxes and peaches 20,000 boxes.

The crop estimates for these three counties were submitted to this office by Mr. I. R. Fletcher, inspector at large, Camas, Washington. The following men gave Mr. Fletcher assistance in making these estimates: P. I. Packard, local horticultural inspector, Underwood, Washington; S. H. Boddinhouse, local horticultural inspector, White Salmon, Washington; B. W. Cooney, local horticultural inspector, Golden-dale, Washington.

SUMMARY OF CROP REPORT FOR THE STATE OF WASHINGTON, BASED ON REPORT PREPARED UNDER DIRECTION OF MR. T. O. MORRISON, ASSISTANT COMMISSIONER OF HORTICULTURE, WASHINGTON

	Apples	Peaches	Pears	Plums & Prunes	Apricots	Cherries	Mixed
Wenatchee-North Central Washington District	7,310	134	380	90	170	80	...
Yakima Valley District:							
Kittitas County	250	...	...	...	...	...	...
Yakima County	6,595	834	752	130	...	...	...
Benton County	160	40	80	...	...	...	...
Walla Walla District:							
Walla Walla, Columbia Counties..	431	...	...	175	...	...	20
Garfield and Asotin Counties.....	71	35	12	...	...	...	...
Spokane District	1,000	...	...	...	...	...	100
Clarke, Skamania, Klickitat Counties	175	20	15
Totals.....	15,995	1,063	1,239	395	170	80	120

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Paul H. Weyrauch, President.



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Our field reaches from Montana to Southern California and from New Mexico to Northern British Columbia.

Cash Weekly. Outfit free, experience unnecessary. **We train you free** in salesmanship, landscaping, etc. Best selling season for years. Good business in your own locality. Work all or part time.

WRITE TODAY. If not interested perhaps you know some energetic, intelligent man now unemployed.

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Largest between the Rockies and Cascades.

thing neither picture nor article can describe, only in a limited way. In the evening the streets in the tenement districts are so filled with push-carts and people that it is absolutely impossible to walk on the sidewalk, and frequently the street is so filled that it is with difficulty one can go through the street. The Editor visited the tenement districts when in New York a few years ago, finding it one of the most interesting sights in connection with the fruit industry that he visited while on a very extensive tour throughout the United States, in which he visited the auction rooms, the public markets, the docks, of practically every large city in the United States.

Normal Schools.—For a considerable time there has been an apparent shortage of school teachers. By that is meant a shortage of school teachers of training and ability. The fact of the matter being there are not enough first-class school teachers to fill all of the schools, and naturally most school teachers prefer to teach in the large cities, consequently the large cities absorb a large part of the first-class teachers, making it very difficult for the balance of the state to obtain satisfactory instructors. In view of this fact it seems the state is justified in maintaining more than one normal school. The Editor being a college graduate, speaks with a great deal of earnestness and has read considerable upon this subject and educational subjects, and does not hesitate to say that Oregon should follow plans in reference to normal schools adopted in some of the other progressive states, that is, maintaining more normal schools. In fact, the State of Oregon should have three normal schools. These should be located in the thickly settled districts, one in the eastern portion of the state, one at Monmouth and one in Southern Oregon. It is a well known fact that a great many more pupils will attend a school or college close to home than will attend if they have to go a long distance. Consequently one or two more normal schools would certainly create a greater attendance, producing a larger number of teachers, and in a short time the supply would be sufficient.

The Keeping Qualities of Apples.—Mr. Charles L. Hamilton, one of the inspectors for the North Pacific Fruit Distributors, and long connected with the Yakima Valley Fruit Growers' Association as inspector, through many years' experience has accumulated some very valuable information for the benefit of the apple grower, which is given in detail in an article appearing elsewhere in this edition. Such information is important. Mr. Hamilton knows and he has told you what he knows. Fruit growers should bear in mind that the keeping quality of an apple is impaired both by being picked too early or being picked too late. Some growers pick too early, others pick too late. This should be corrected. Mr. Hamilton also lays particular stress on the fact that apples after being picked are

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All Over the
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Produce Reporter Service also includes the assistance of a qualified Inspecting and Adjusting Department that, **should** any of your cars be rejected, you can wire, and we will immediately inspect and report to you the true quality and condition of the goods and the best adjustment or new sale that can be made.

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**ORCHARDING in
NEVADA COUNTY,
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Winning Home of the Bartlett Pear

CLIMATE ideal for fruit-raising—ideal for health. Altitude (2500 feet) just right for healthy orchards and healthy orchardists. There's money in Bartlett Pears and Nevada County, California, grows the best in the world. *Won the highest award at the Panama-Pacific International Exposition.*

Land values have not been boosted sky-high here. *Good acreage along the railroad costs but \$40—only \$100 just outside the city.* Write for literature to

CHAMBER OF COMMERCE, Grass Valley, California
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gain
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FALL
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**ROSES
TREES
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**64 PAGE
FALL
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*Listing the
best new and
the popular stand-
ard varieties.*

Ask for

CATALOG No. 201



**Portland Seed
Company**
PORTLAND, OREGON

allowed to lay in packing houses frequently many days before being packed, another mistake which is frequently made in the Northwest and one that must be corrected.

Displacement of Horses by Tractors. Tractors are being found to be so much more efficient and economical that the United States Government is giving the matter particular study, having issued an article containing much information on the subject, which is well worth reading. The article appears on another page in this edition.

The Fruit Growers' Agency, Incorporated, has established a special office in the Federal Building in Spokane, which will be the headquarters for the news service of the Fruit Growers' Agency. Information about the movement of crops, prices, conditions, etc., will be furnished in weekly, sometimes daily, letters and occasionally telegrams to all the members of the association.

Watersprouts and surplus limbs take too much water from the trees in time of drouth; prune out those which are not needed on the tree and save the water for the ripening fruit; fruit won't mature well where shaded by sprouts. The crop shows up better where the tree is kept pruned, admitting sunlight and air, and enables the buyer to see the fruit better. These statements are not guesses or mere opinions. They are some of the things that have been proved by careful tests at the Missouri Agricultural Experiment Station.

Fruit Growers' Conference

Preliminary outline of subjects suggested for Ninth National Apple Show Conferences of Fruit Growers, to be held at Spokane, Washington, November 20 to 25, 1916.

Four days of conferences suggested. Two days to be given to discussing marketing under auspices of the Fruit Growers' Agency; one day to orchard problems, and one day to by-products. These are just preliminary suggestions. We must learn not only the subjects that the growers need to discuss, but the subjects in which they are so vitally interested that they will attend and discuss. A vitally important subject will bring five hundred growers. It can be profitably followed by another subject that will not interest the growers so directly, but may be more important to their future. We want suggestions of live subjects and of men that are qualified to discuss them.

Orchard problems: Fruit buds. How shall we maintain the vigor and bearing of our old trees? Are we feeding the trees enough to produce fruit in commercially profitable quantities? Fertilizing. Cover crops as food for the orchard. Summer pruning. Pest control. Orchard accounting to determine costs.

By-products: The evaporator question. A discussion led by Dr. J. S. Caldwell of the State College of Washing-

C. & S. Clean & Slippery Grease makes the wheels go 'round four at a time and no stalling.

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My 250-page free catalog tells you why I sell direct to user, at wholesale, these and other implements, built in my own factories at Waterloo, at prices one-third to one-half less than you usually pay for first-class goods. All sizes, styles and prices of separators, engines and spreaders. My Farmobile (tractor) has no equal for simplicity and efficiency. State what you need.

250,000 customers testify to quality of the Galloway line of goods. Write today for your free copy of this wonderful book of bargains for farm and household.

WM. GALLOWAY, Pres.,
WM. GALLOWAY CO.,
105 Galloway Station
Waterloo, Iowa.

Engines \$26.75 up
Separators \$64.75 up
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My Magazine **INVESTING**
FREE For **FOR PROFIT**
Six Months

Send me your name and address right NOW and I will send you **INVESTING FOR PROFIT** magazine absolutely free for six months. It tells how to get the utmost earnings from your money—how to tell good investments—how to pick the most profitable of sound investments. It reveals how capitalists make \$1,000 grow to \$22,000—in fact gives you the vital investing information that should enable you to make your money grow proportionately. I have decided this month to give 500 six-months subscriptions to **INVESTING FOR PROFIT** free. Every copy is

WORTH AT LEAST \$10.00

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H. L. Barber, Pub., 533-30 W. Jackson Blvd., Chicago

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**HOOD RIVER'S LARGEST
AND BEST STORE**

**RETAILERS OF
EVERYTHING TO WEAR**

AGENTS FOR
**HAMILTON & BROWN AND
THE BROWN SHOES**
**HART, SCHAFFNER & MARX
CLOTHES**
MANHATTAN SHIRTS
JOHN B. STETSON HATS
NEMO CORSETS

Strictly Cash—One Price to All

tion, illustrated with drawings of types of evaporators and samples of product. How the Wenatchee district is meeting the evaporator problem in a community way. What can we raise that can be profitably sold in cans, and what can the grower make raising this stuff? A discussion led by W. H. Paulhamus.

Marketing: Picking and handling the fruit so that it will stand up in storage. Storage. Community packing houses. Mechanical helps in the packing and handling of our fruit. How can we secure an inspection that will keep

Apple Distribution

Can eighteen thousand and five hundred cars of box apples be distributed successfully under the private sale system now used?

Can the several apple operators that have controlled marketing in the large cities distribute their share to the profit of all the growers?

Twelve thousand seven hundred cars grown in 1912 brought ruin to the orchard owners. Thirteen thousand five hundred cars of apples produced in 1914 brought red ink to some growers and no profit to the rest.

1916 alternates with 1912 and 1914, large crop years.

The problem of profitable distribution of seven thousand more cars than last year and of five thousand more cars than the banner crop year of 1914, is too large for the present marketing system—but the auctions of the largest cities, with aid of eastern prosperity, can expand the market so as to bring moderate profit to all the growers. Adv.

PRUNE AND WALNUT TREES FOR SALE

We offer fine stocky prune trees and Vroom strain grafted walnut trees at bed-rock prices. Also a full line of other nursery stock at bargain rates. Write today.

BENEDICT NURSERY CO.

185 E. 87th St. N.

Portland, Oregon



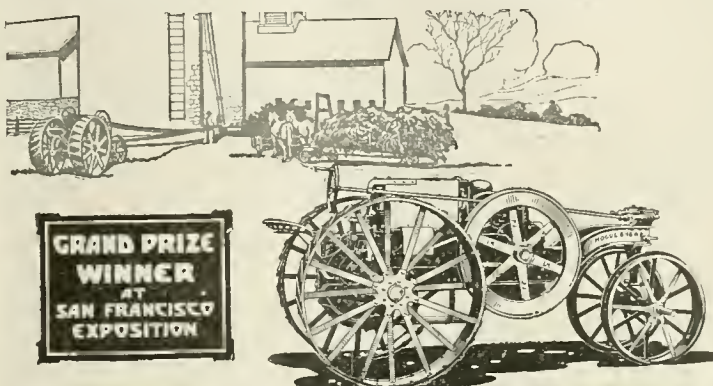
TOWER'S FISH BRAND

everything about a rainy day seems to say to keep dry, to work in comfort wear the **FISH BRAND REFLEX SLICKER \$3.**

A.J. TOWER Co - BOSTON

Mogul 8-16—A Real Kerosene Tractor

Sells for \$725 Cash f. o. b. Chicago



WHEN you buy a tractor, look beyond the price. It is not the price a man pays for a tractor which is of the most importance, but **what its power costs.** A Mogul 8-16 burning kerosene, in 5,000 hours of work, will save more than its original price over the cost of the same power produced by a gasoline tractor. Remember, the 8-16 is a real kerosene tractor, planned and built originally for using this cheap, plentiful fuel. Price is of minor importance compared with **Mogul 8-16** saving.

It is our policy to sell the Mogul 8-16 at the lowest possible price, always maintaining **Mogul** quality, though nowadays some of the materials are almost unobtainable even at an advance in price of from 50 to 100 per cent over the prices of a few months ago. \$725 cash f. o. b. Chicago is the lowest price at which **Mogul 8-16** can be sold.

Orders placed at once will stand the best chance of being filled without delay. See the **Mogul 8-16** dealer or write us for the story of kerosene before you buy any tractor.

International Harvester Company of America
(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
San Francisco, Cal. Spokane, Wash. Salt Lake City, Utah

A Checking Account

with this bank places your dealings on a business basis and systematizes payments. Moreover, it is our aim to give individual service to our depositors—to give advice on business matters when it is asked—to offer a progressive, helpful banking service. Put it to the test.



Oldest Bank in the Northwest

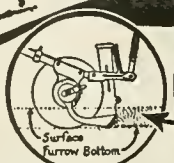
LADD & TILTON BANK
PORTLAND, OREGON

poor fruit off the market and will guarantee the pack? What varieties and sizes of apples are unprofitable? Are we making a mistake in offering more than two grades of fruit on the Eastern market? What improvements do we need to make in our package? What kind of a special package can we use to move the lower grade apples? How shall we sell our apples if we are to continue to sell at a profit? What must

we do to organize to sell our apples at a profit in the future? The service of the United States Office of Markets. Uniform accounting for the marketing organizations. Advertising to develop markets for our apples: What is being done? What can be done? What can we do to develop better outlet for our apples in the Northwestern states. What revisions shall we ask in our horticultural laws?

Buy Now!
Save 15%

**297 Peoria Drills to go—
then prices advance!!**

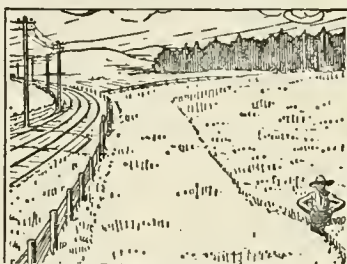
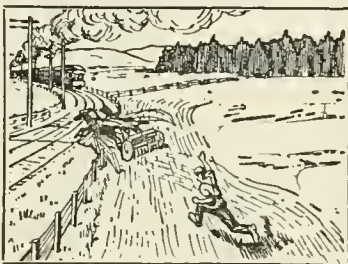


Plant Right for Big Crops!

You should buy a Peoria Drill because it will make you more money through bigger crops—because it plants the seed deep and in the right spot. It isn't wasted when planted by a Peoria, nor does it feed the birds. It grows and produces.

Now is the time to buy—the season is right and we are still selling at the old BEFORE THE WAR PRICES. In a month or so our present stock will be gone and our price must go up because we will have to pay more ourselves. Buy now.

This Man Had A LUCKY ACCIDENT



Read Mr. Rummens' Letter About It—

R. M. WADE & CO. Portland, Ore.

Pomeroy Wash., Oct. 16, 1914

GENTLEMEN—Last year I was using a (name furnished on request) grain drill to seed ground and while working along the right-of-way the team became frightened and ran across the tracks breaking up the drill badly. I set the broken drill aside and purchased a New Peoria Disc Drill from your Pomeroy, Wash. agent, Mr. J. R. Stevenson, taking it out and starting to work again where I left off with the other drill. I wish to say that I was perfectly astonished at the results. When the grain was grown, the point where I had begun with the Peoria could be easily marked with the eye. The grain sowed by the Peoria was about four inches higher and at least fifteen to twenty percent thicker. To say that I was highly pleased with the results is stating it mildly.

Very truly yours, W. J. RUMMENS

For 51 years we have sold farm implements in the Northwest and our line suits local conditions best.

R. M. WADE & CO.
SINCE 1865
PORTLAND, ORE.
329 HAWTHORNE AVE.
or
THE COFFMAN CO.
910-928 Howard Street
Spokane, Wash.

We occupy an entire block in Portland on Hawthorne Avenue where we carry an enormous stock.

The Keeping Quality of Apples

By Charles L. Hamilton, North Yakima, Washington

THE apple growers of the Northwest have been gradually improving their methods of orchard operation; that is, they have in a large measure come to the point where a considerable majority appreciate the necessity for thorough and scientific work in the production of their crops. They have come to realize that fine apples, like any other superior product, require for their production the application of certain now more or less well defined rules and systems for irrigation, cultivation, pruning, spraying and thinning, these regulations only varying slightly to meet the peculiar needs of various local conditions, until at the present time they are able to produce from their orchards good yields of ex-

ceptionally fine appearing apples. They have also spent a great deal of time, money and effort on the improvement of the pack and grade of this fruit, and it is now a recognized fact that the pack and grade, especially of those organizations or dealers who have established brands, is much better than that of the Eastern and Middle Western sections. But even with the improved method of growing, and with the high standard of pack and grade, the growers of the Northwest must realize that the Eastern and Middle Western sections are rapidly adopting the Western methods and that it will be but a short time until their apples will be selling alongside of ours at about the same prices. This condition is further characterized by the fact

that the consumer has little or no preference, so long as he gets a good apple at a fair price. The situation is also made even more serious for the Northwest apple grower by reason of the large freight differential working in favor of those sections nearest the large Eastern markets. To meet this threatened danger to the apple industry of the Northwest, and overcome it, something must be done to keep our apples in the lead; we must continue to produce a superior product. If we fail in this we will find our fruit competing on a par with Middle Western and Eastern barrel stock, which of course would mean practically an end to growing apples on a large commercial scale here in the Northwest. This is a thing which is not only possible, but is practicable, and can be secured by the proper handling of the apples.

If we are to continue to produce "something better" we must devise ways and means for keeping in the lead of our aggressive neighbors east of the Rockies. We do not mean to place too much emphasis on this phase of the matter or appear in the light of a "calamity howler," but that there is an Eastern peril and one which we must some day meet we believe no one will dispute. That it has already become quite markedly apparent may be verified by any of our Western sales agencies.

We do not propose to offer an entire solution of this new problem which confronts the fruit growers of the Northwest, as there must be systematic co-operation between the several departments of our industry to secure this result; that is, our traffic departments

Turn AppleWaste to PROFIT

Cider Making

Will Pay
Someone in
Your Section
Handsomely

Will It Be You?



Start a paying business that grows almost without effort. Thousands are making **Big Money** turning apple waste into profit for their neighbors by making **Good Marketable Cider** from windfalls, culls, undergrades, etc., on

Mount Gilead Hydraulic Cider Presses



**HYDRAULIC PRESS
MFG. CO.**

60 Lincoln Ave. Mt. Gilead, Ohio
Pacific Coast Representatives
THE BERGER & CARTER CO.
17th & Mississippi Sts., San Francisco, Cal.

RAT CURE
TABLETS
ONLY RATS WILL EAT
TRY BEFORE YOU PAY
KILLS 4 RATS FOR 1 CENT
MORISITE MFG. CO., Dept. 3 BLOOMFIELD, N. J., U. S. A.

must labor with the railroads for lower freight rates or better transportation facilities; our sales departments must do their part in the advertising of our product and the development of new markets, getting our fruit to the consumer at a fairly remunerative price to the grower; our organizing departments must work as a whole to get the growers together and keep them there. These departments, however, will be helpless and their work of no avail unless the growers themselves give them a superior product to work with—not something just a little better, but something which will far surpass the product of other and competing sections. It is to this phase of the subject that I wish to draw your attention—to the producing of apples which have something which the others have not, and “that something,” in the case of the apple, we believe is superior keeping qualities. This is a thing which is not only possible, but practicable as well, and can be secured by proper handling of the fruit. I wish to offer a few suggestions along this line, as it must be the first move on the part of the fruit growers of the Northwest to thwart the growing Eastern menace, and is one with which we have had some intimate experience during the past two seasons.

It is a well known fact that apples which grow on young trees will not hold up as well as those from older trees, nor will the fruit from low elevations hold up as well as that from the higher elevations, provided the fruit is picked at the same time and handled in the same way; but when it is picked at the same stage of ripeness and handled in the proper manner this difference to a certain extent disappears. To secure the proper degree of ripeness it may be necessary to pick on the lower elevations from a week to two weeks earlier than on the higher land.

It has been the custom with a great many of the growers of the Northwest

DENNEY & CO.

CHICAGO

Specialize in Box Apples and Other Western Fruits

We're ready to talk business with
those having good fruit.

Write or wire us what you have to offer,
or communicate with

F. H. HOGUE, North Yakima, Wash.



Save one-half

MICA AXLE GREASE lasts twice as long as ordinary axle grease. Contains powdered mica—a mineral lubricant that is practically wear and heat-proof. It gives a cool, slippery coating that clings to the spindle, makes easier pulling, and out-lasts plain grease two to one. Saves harness, saves horses, saves money. Get a can from your dealer today.

Standard Oil Company
(California)

MICA AXLE GREASE

J. & H. GOODWIN, Ltd. Apple Importers

Commercial Sales Room, Deansgate, Manchester, England
Floral Street, Covent Garden Market, London, England
Fruit Exchange, Victoria Street, Liverpool, England
Humber Dock Street, Hull, England

AMERICAN ADDRESSES:

97 Warren Street, New York, N. Y. 60 State Street, Boston, Massachusetts

Consignments and Correspondence Solicited

to wait until their apples were highly colored, regardless of the degree of ripeness; pick them in a careless manner and leave them in the orchard boxes out under the trees for a number of days. Sometimes the fruit is protected from the sun, and sometimes it is not. Later, at their convenience,

they haul it into a packing house, where it is sorted and packed, and eventually loaded onto a wagon and delivered to their organization or dealer.

By the time these apples reach the shipper they have had most of the keeping quality taken out of them by the manner in which they have been han-

Make Money on the Fruits You Throw Away

Spread apples and other fruit, berries or vegetables on the "Granger" Evaporator and go about your work. No attention, no bother. No sugar to buy, no jars. Evaporated fruits and vegetables are most wholesome and delicious and enjoyed by all the family. All you need to furnish a supply for home use or for sale at a good profit, is a simple, well-built and reliable

"Granger" Evaporator

Use it by resting on back of kitchen stove. No extra cost for operation. Get one now for use this season. Save money drying your own products. Made in two handy sizes, at \$5 and \$10, delivered anywhere and guaranteed satisfactory or your money back. Write for Booklet G

GRANGE SALES ASSOCIATION
Lafayette Bldg., Philadelphia



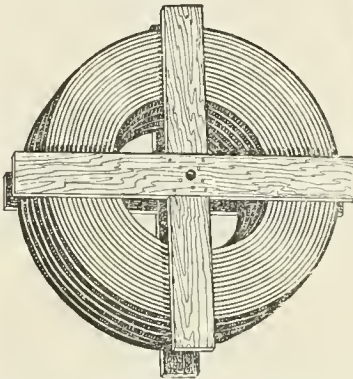


Store Your Apples in a Warehouse Proven Superior Efficient Service

Storage-in-transit privilege.
Free Switching, Low Storage
and Insurance Rates.
Liberal advances.
Wire for proposition.

OMAHA COLD STORAGE CO., Omaha, Nebraska

Spend a Nickle and Save a Dime



No. 3 Peerless Duplex Strapping in coils of 6,500 feet each—\$14.63 per coil with liberal discount.

Use Peerless Duplex Strapping ON YOUR Shipping Boxes

and

- (1) You will prevent pilfering.
- (2) You will prevent damage in handling.

No. 3 Duplex Strapping is made of high grade Cold Rolled Steel of considerable tensile strength and pliability. The turned edge protects the packer's hands; the knurled center prevents the nail from slipping while being driven.

**Discounts and Information from
Pacific Coast Representatives**

A. C. RULOFSON CO.

No. 359 Monadnock Building, San Francisco, California

TWISTED WIRE AND STEEL CO.

515-521 Greenwich Street, New York, N. Y.

Minneapolis Cold Storage Co.

Latest and Modern Construction with Automatic
Sprinkler Protection Throughout.

Located on Gt. Nor. and C. B. & Q. Tracks
with Free Switching to and from All Roads

Storage-in-Transit Privilege with
Low Storage Rates and Liberal Advances.

Write or wire us.

71-89 West Island Ave., Minneapolis, Minnesota

L. B. KILBOURNE, President

L. A. GOSS, V.-Pres. and Mgr.

dled, and by the time they reach their destination, if shipped out immediately, they are overripe, and in some cases even show decay. The dealer at the other end takes a "bumping" on the fruit handled in this manner, and begins to look around for some good Eastern barreled stock. Or if this fruit, instead of being shipped immediately, is held at the growing end for any length of time, it is usually necessary to repack before shipping. Such is the result of this method of handling the fruit from the time it is packed until it reaches the consumer.

There is another type of grower in the Northwest who, having made a study of the proper method of handling his fruit, begins picking his apples when they have reached the proper degree of ripeness, regardless of the color. He handles the fruit carefully, being careful to pick the fruit with the stems intact, and avoids all bruising from rough handling; hauls it into the packing house as soon as it is picked, packs it up immediately and delivers it to his shipper, usually within a period of thirty-six hours from the time it is picked. This fruit may not look quite as well as that which has the heavier color and which has received the indifferent handling, but from the standpoint of quality it is worth a great deal more money; for as a rule a "Fancy" or "Second Grade" will bring considerably more when it is known to possess good keeping qualities than an "Extra Fancy" or "First Grade" which has had the life taken out of it before it reaches the trade.

The time for picking the different varieties is rather a hard one to describe. Let us take two varieties as examples—one a fall apple and the other a winter apple. In the case of the Jonathan apple the grower should watch the fruit carefully, and as soon as the trees show a heavy enough percentage of fruit which has two-thirds good red color they should begin picking. Jonathans, to be in prime condition, should be a dark green color, and not show the yellow tinge which this variety takes on when it starts to ripen. Occasionally we find in the orchards in the Yakima Valley Jonathans which will not come up to the two-thirds color requirements, but start to turn a yellow, creamy color without developing the red sufficiently to meet the Extra Fancy grade rules. The fruit, when in this condition, is a little past the proper stage of ripeness for this variety and

OREGON SEEDS

Vetch or "Tares," a great forage or seed crop.
Red Clover
Alsike

"Three Grain Oats," wonderful yielder.
Gray Winter Oats

We will be glad to communicate with you on any of your requirements, send samples and quote prices. We have the largest and best cleaning facilities in the Willamette Valley. Let us hear from you on car lots.

CORVALLIS FLOURING MILLS
CORVALLIS, OREGON

Home of the famous Oregon Agricultural College

should not be allowed to hang longer on the trees. In one sense this matter of sacrificing color for keeping quality, or keeping quality for color, resolves itself into a dilemma for the grower, but it has been our experience that the grower who pins his faith on the keeping qualities of his fruit rather than on color stands a far better chance of coming out ahead of his brother grower who chooses the other alternative. At least, we feel perfectly safe in saying this is true in the long run and believe the records of our sales agencies would verify it. For instance, the conditions in the Middle West which our salesmen have had to face the past few months with our fall apples go far toward proving our contention. On the other hand, color need not be altogether sacrificed, as it may be helped in a very large degree by certain methods of cultivation and pruning, while keeping qualities can only be attained by picking at the proper time and careful and expeditious handling thereafter.

After the time of picking has been decided by the individual grower, he should make every effort possible to harvest this variety in as short a time as possible. The fruit should be carefully picked and hauled directly from the orchard on a wagon or a truck which is equipped with a set of good springs, to the packing house, where it should immediately be sorted and packed. In the sorting and packing care should be taken to properly handle the fruit; bruises and punctures should all be taken out, and only the good sound fruit packed. The packer should take care to see that the stem of one apple does not come against the cheek of another, as when the pressure is applied in nailing on the lid and in the subsequent jostling of the box incident to transportation, this will cause a bruise or puncture; or that his packs do not run too high, as this will cause bruising of many apples when the lid is pressed home. He should have not more than the required three-fourths bulge on the top and on the bottom and should have the apples firmly in the box cross-ways.

After the fruit is packed it should be hauled to the warehouse in a wagon which has a good set of springs. The apples should be delivered on the same day they are packed, if possible, or if not, at least within twelve hours after they are packed, as the matter of time which the fruit is held on the ranch or in the packing shed after being picked and before it reaches proper storage is crucial in determining its keeping qual-

Hawkeye Tree Protectors

One rabbit in a single night can ruin many trees. Trees only girdled are almost worthless. Get dollars' worth of protection at a fraction of a cent cost with Hawkeye Tree Protectors. Made of elm veneer, chemically treated. Easily put on, last long. Get them on your trees before the snow comes. 1c each in 100 lots; 3c in 1000 lots. Send for circular and sample. Burlington Basket Co., 118 Main St., Burlington, Iowa.

Sure, Sure, Certain, Safe.

Fruit Prices Are Soaring We Have the Trees

Mr. Planter: Do what you should have done three or four years ago. Plant a commercial orchard bordered with the Vrooman Strain Franquette English Walnut

Mr. Salesman, write us the territory.

Capital City Nursery Company
SALEM, OREGON

PORTLAND, OREGON

Portland Hotel

The hotel which made Portland, Oregon, famous.
Most Desirably Located. In the Center of Shopping and Theatre District.
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets
European Plan—\$1.00 per day and upward

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly

SEND FOR BOOKLET

Arcadia Orchards Company
Deer Park, Washington

FOR FALL SOWING
 "Diamond Quality"
TESTED
CLOVERS—ALFALFA
VETCHES—GRAINS
GRASSES and FIELD
SEEDS
MIXTURES for DRY LAND—
WET LAND—BURNS—Permanent
HAY CROPS and PASTURES—
COVER CROPS for ORCHARDS
WRITE FOR SAMPLES
 and Prices or Send in Your
 Order—You will Receive
 Prompt Service and Full Value
ASK FOR CATALOG No. 200
PORTLAND
SEED CO. 
 Portland, Ore.
 Agents "CLIPPER" Fanning Mills

WATER LEVEL GRADE THRU THE CASCADES



**NORTH BANK
ROAD**

A PLEASANT ROUTE EAST

Along the Grand Canyon of the Columbia, the Rim of the Great Snake River Canyon, Spokane and the Inland Empire.

Two Fine Trains

DAILY

Portland to Chicago

in 72 hours

CALIFORNIA

S.S. "Great Northern" and
"Northern Pacific"

the ships that equal trans-Atlantic liners
for speed and equipment

Hawaiian Cruises

S.S. "Great Northern," Nov. 7 and 27

Send for Hawaiian literature.

R. H. CROZIER, A. G. P. A.
PORTLAND, OREGON

ities. The shorter the time at the picking and packing end, the longer the life of the apple.

With the Winesap, which we select as our example from the winter varieties, the same method in regard to the picking and handling should be followed. To properly determine when this apple should be picked depends upon the locality in which it is raised. It is a safe rule, however, to begin picking just as soon as the apple has taken on the light, bright red color characteristic of the variety. A great many of the orchardists in the Northwest are under the impression that this variety of apple should be a dark red or almost a black color. This condition, however, is not desirable from the standpoint of keeping qualities. It shows a condition or ripening on the trees, and usually those apples which have the deep red or black color are beginning to show some water-core. Water-cored apples, while they will hold up a certain length of time, cannot be compared in their keeping qualities with those which are picked earlier and which have the light, bright red color. The same rules which we have suggested for handling these varieties will hold good as to other varieties, with such modifications and additions as the peculiarities of each individual variety may require. It is, of course, also true that every man's orchard is a unit in itself, or even small sections of the same orchard. Each block of an identical variety where conditions are entirely similar should be handled as a unit.

The ideal method of handling apples is through the cold storage room, but of course there are a good many districts in which this is not possible. Fruit for cold storage purposes should be placed in the cold storage plants the same day that the fruit is picked and packed, or if this is not possible, it should at least be in on the second day. We have learned from experience that, to hold fruit in storage, it is absolutely necessary to place it there while it is in the same condition it was in when taken from the trees. Our experience shows that fruit which has been held in dry storage for any length of time and which has not been properly handled on the ranch will not hold in cold storage.

I believe it is Mr. Davidson who is responsible for the truism that "The best time to place an apple in cold storage is the day it is picked, the next best time, the day after." If this could be followed literally or even approximately in conjunction with the other suggestions we have made, by Northwest apple growers, we believe that we would be well on the way to giving our fruit "that something" in the way of keeping qualities which would place it in the lead of all other sections, and maintain, insofar as the producing end of the industry is concerned, that marked superiority with which the Northwest apple has been naturally endowed and upon the continued maintenance of which the future of the industry largely depends.

308 X Yes is a Vote for Your Children

Square Deal for Eastern Oregon

If you are in favor of a square deal for the country East of the Cascades you will vote for and work for THE PROPOSED EASTERN OREGON STATE NORMAL SCHOOL AT PENDLETON, OREGON.

Trained Instructors Wanted

Every resident of Eastern Oregon has a vital interest in the passage of this measure, for Eastern Oregon pays HIGH SALARIES to her teachers and is entitled to the services of TRAINED INSTRUCTORS.

Only Costs 4 Cents per \$1,000

The annual cost of maintenance of the proposed State Normal School amounts to BUT ONE 25th OF A MILL OR 4 CENTS ON A THOUSAND DOLLARS of taxable property. Isn't it worth this to you to have your children trained to become USEFUL AND PRODUCTIVE citizens?

Strong Endorsements

Among those who strongly endorse the establishment of the proposed Eastern Oregon Normal School are Governor Withycombe, J. H. Ackerman, President of the Monmouth State Normal; W. J. Kerr, President of the Oregon Agricultural College; F. L. Campbell, President of the State University; Robert C. Franch, former President of the Weston Normal, and practically all of the leading educators of the State. J. A. Churchill, Superintendent of Public Instruction, voices the sentiments of those who are most familiar with the need of more adequate Normal facilities when he says:

"Oregon's greatest need for its rural schools is the teacher who has had full preparation to do her work. Such preparation can best come through Normal School training."

"I trust that the voters of the State will assist in raising the standard of our schools by establishing a State Normal School at Pendleton. The location is central, the interest of the people of Pendleton in education most excellent, and the large number of pupils in the public schools will give ample opportunity to students to get the amount of teaching practice required in a standard normal school."

Vote Right

By voting YES for No. 308 you will help to give to the school children of Oregon the same advantages enjoyed by the school children of our neighboring states.

Vote YES for No. 308.

Eastern Oregon State Normal School Committee

By J. H. Gwinn, Secretary, Pendleton, Oregon

(Paid advertisement.)

Tarred Berry Twine

For tying Lagonberry, Raspberry and Blackberry vines or other small fruits and shrubs to trellises, stakes or supports.

A single Tarred Yarn, about 400 feet to the pound, put up in 5-lb. balls, 10 balls to the sack.

The time will soon be at hand for cleaning up berry patches and getting vines and shrubbery in suitable condition for another year.

Sold by All Dealers Handling Orchard Supplies

MANUFACTURED BY

The Portland Cordage Co.
PORTLAND, OREGON

How the Apple Forms Its Buds

[From Fruit-Bud Development of the Apple,
by F. C. Bradford.]

UNDER normal conditions the Yellow Newtown forms its fruit-buds on two or three-year-old wood. Under favorable conditions a bud produced in the axil of a leaf on wood of the current year will produce next year a short spur, with whorled leaves, and in the following year this spur will bear fruit. Normally the spur, having borne fruit, will form a fruit-bud during the succeeding year, which may be expected to bear again the following year. These apparently normal conditions are often changed, however. A spur may bear fruit two years in succession and the terminal or sometimes axillary buds produced one year may bear fruit the following year. The Newtown is not one of the varieties that regularly form axillary fruit-buds on new wood and nothing in relation to the time of forming such buds was definitely learned.

Terminal fruit-buds on one-year-old wood are formed more or less in all varieties and are numerous enough in some to be considered normal. This condition was so widespread in the Oregon Agricultural College orchards in 1914 that it was observed on all varieties except one or two. It is very common in Yellow Newtowns, especially on young trees, their entire first crop resulting from such buds. On older trees, this formation of fruit-buds seems to be an expression of superabundance, that is, it is when a tree is forming fruit-buds in great abundance that many will be found as terminals of one-year-old wood. If the number of buds being formed is small, there will be practically none at all on the one-year-old wood. The reduction in numbers is so great that it does not seem to be a mere shrinkage of numbers, but an actual shifting of proportions.

The actual time of visible differentiation into fruit-buds of this class of Newtowns is somewhat behind that taken as normal. On buds taken August 11, 1912, the terminals were considerably less advanced than the normal buds at this time. Yet, by September 16, when other material was taken these buds seemed to be fully as far advanced as the normal. It is well known that the terminal clusters open earlier in the spring than the others.

The earlier stages of buds on two or three-year-old wood, which are forming fruit-buds for the first time, are similar to those on spurs bearing fruit during the current year. Differentiation into fruit-buds begins at the same time and continues well throughout the summer. The condition of the average bud of this class is the same as that of the buds of older spurs, which have borne in previous years. The fact that late development is so rare suggests that the few cases observed may have been caused by any accidental summer pruning.

Many buds have been found on spurs which are bearing in the current year, which matured fruit in two successive

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years. Sections of buds from bearing spurs showed fruit-buds formed for the following year. In this case, the condition of the tree as a whole seems to have considerable influence on it. In a year of a very small crop, those spurs which were bearing were as likely to form fruit-buds for the next year as those not bearing. On the other hand, when a tree is bearing a full crop, very few, even of the spurs not bearing, will form fruit-buds for next year. Those spurs that have borne fruit previously but are out of bearing the current year, showing less variation in time of differentiation and more uniformity of development than is shown by fruit-buds on spurs that have borne in previous years. Yet, even in these buds there is some late development, early stages being occasionally found in late August but less than was found in buds of other kinds. Because of this relative stability, the development is considered as normal to which all other classes of buds are referred.

Buds from spurs that have borne blossoms in the spring of the current year, but have failed to set or to carry the fruit for any considerable period of time, show throughout the summer every possible range of variation from the first differentiation to stages even slightly in advance of the normal. This may be more or less related to the period at which the fruit has fallen, the most advanced occurring on spurs where the blossoms failed to set fruit and the earliest stages appearing where the fruit hung for a long time.

There has thus been shown some difference in the time of fruit-bud formation in buds in different positions. This is observable until late in the fall, when all fruit-buds seem to be retarded measurably in their progress, and develop equally from then on, until very near the time of blossoming in the spring.

Fairs, Land and Apple Shows

Idaho State Fair, Caldwell, October 3-6.
Harney County Fair and Horse Show, Burns, Oregon, October 3-7.
Klickitat County Fair, Goldendale, Washington, October 4-7.
Northwest Land Products Exposition, Seattle, Washington, October 4-14.
Mountain Farm Bureau Fair, Ahwahnee (Grub Gulch), California, October 6-7.
West Clallam County Fair, Forks, Washington, October 10.
Clallam County Fair, Port Angeles, Washington, October 12-14.
Kern County Agricultural Fair, Bakersfield, California, October 24-28.
Ninth National Apple Show, Spokane, Washington, November 20-25.
Northwest Livestock Show, Lewiston, Idaho, November 26 to December 2.
Cascade International Stock Show, North Yakima, Washington, November 27 to December 2.
International Livestock Exposition, Chicago, Illinois, December 2-9.
Pacific International Livestock Exposition, North Portland, Oregon, December 4-9.
National Western Stock Show, Denver, Colorado, January 20-27.

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Farm Loan Act, Etc.

Continued from last issue

Amortization Plan of Repaying Loans

It has been said that all loans are to be repaid on the amortization plan. This plan calls for a number of fixed annual or semi-annual payments, which include not only all interest and charges due the bank, but the principal as well. These payments are so calculated as to extinguish the debt in a given number of years. After five years the borrower has the right on any interest date to make additional payments on the principal in sums of \$25 or any multiple thereof, thus discharging the debt more quickly. The table given below illustrates how a loan of \$1,000 bearing interest at 5 per cent would be retired in twenty years by an annual payment of \$80.24. A study of the columns shows how from year to year the interest is reduced and the proportion of the payment which goes to discharge the principal steadily increases. The final payment cancels the debt:

ANNUAL PERIODS	Total annual payment	Interest at 5 per cent	Paid on principal	Amount of principal still unpaid
1	\$80.24	\$50.00	\$30.24	\$969.76
2	80.24	48.48	31.75	938.00
3	80.24	46.90	33.31	904.67
4	80.24	45.23	35.01	869.66
5	80.24	43.48	36.76	832.90
6	80.24	41.64	38.59	794.31
7	80.24	39.71	40.52	753.79
8	80.24	37.68	42.55	711.23
9	80.24	35.56	44.68	666.56
10	80.24	33.32	46.91	619.64
11	80.24	30.98	49.26	570.39
12	80.24	28.51	51.72	518.67
13	80.24	25.93	54.31	464.36
14	80.24	23.21	57.02	407.34
15	80.24	20.36	59.87	347.46
16	80.24	17.37	62.87	284.60
17	80.24	14.23	66.01	218.59
18	80.24	10.93	69.31	149.28
19	80.24	7.46	72.78	76.50
20	80.33	3.83	76.50	.....
Total... \$1604.89 \$604.81 \$1000.00 				

Funds Available for Loans

After a Federal land bank has loaned on first mortgage \$50,000, it can obtain permission from the Farm Loan Board to issue \$50,000 in farm-loan bonds based on these mortgages, sell such bonds in the open market and use the money thus obtained to lend on other mortgages. This process of lending on

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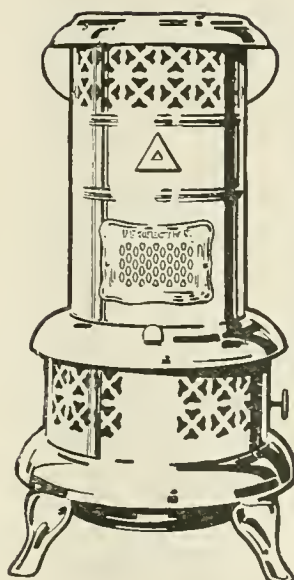
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mortgages and selling bonds in issues of \$50,000 may be repeated until bonds to the amount of twenty times the bank's paid-up capital are outstanding. If each bank should have only its required minimum paid-up capital of \$750,000, this plan will provide eventually, if all the authorized bonds of the twelve banks are sold, over \$180,000,000 to lend on first mortgages on farm land. The banks, however, can increase their capital stock above the required minimum and so increase the amount of bonds they can sell, and thus increase the total amount of money available for loans on farm mortgages. To make these bonds attractive to investors, the bonds, together with the mortgages upon which they are based, are exempted from federal, state, municipal and local taxation and are made legal investments for fiduciary and trust funds. The capital stock of the Federal land banks is also exempt from taxation. Federal reserve banks and member banks of that system are empowered to buy and sell these bonds. They are to be issued in denominations of \$20, \$50, \$100, \$500 and \$1,000.

Organization of Banks

The temporary management of the Federal land banks is to be in the hands of five directors appointed by the Federal Farm Loan Board. As soon, however, as the subscriptions from the loan associations total \$100,000, regular directors are to be appointed as follows: Three district directors, resident in the district, shall be appointed by the Federal Farm Loan Board to represent the public interest, and six local directors, resident in the district, shall be elected by the farm-loan associations, who must be stockholders in the bank. The Federal Farm Loan Board shall designate one of its appointees to act as chairman. The act requires that at least one of the three district directors shall be experienced in farming and actually engaged at the time of his appointment in farming operations within the district. Any compensation paid to the directors must be approved by the Federal Farm Loan Board.

Officers of Loan Associations

Each loan association must have a board of directors and a secretary-treasurer. The directors shall serve without pay. The secretary-treasurer shall receive such compensation as

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may be determined by the board of directors. The association must appoint an appraisal committee for the purpose of valuing lands offered as security for loans. No member of such committee shall have any interest in the property upon which he passes.

Funds for Current Expenses

To provide funds for current expenses, the loan association may retain as a commission from each interest payment not to exceed one-eighth of one per cent semi-annually upon the unpaid principal of the loan. This commission is to be deducted from the dividends payable to such farm-loan association by the Federal land bank. If the commissions are not adequate, and an association does not wish to assess members for current expenses, it may borrow at 6 per cent from the Federal land bank to an amount not to exceed in the aggregate one-fourth of its bank stock.

Reserves and Dividends

The law requires both the land banks and the farm-loan associations to make provision for certain reserves before they can pay any dividends.

Agents of Land Banks

In sections where local conditions do not make the formation of associations practicable, the Farm Loan Board may authorize the Federal land bank to make loans through agents approved by the board. These agents are to be banks, trust companies, mortgage companies or savings institutions, chartered by the state. They may receive as compensation the actual expense involved in transacting the loan and in addition thereto a sum not to exceed one-half of one per cent per annum on the unpaid principal of the loans made through them. When the Farm Loan Board decides that a locality is adequately served by farm-loan associations, no further loans are to be made through agents.

Joint-Stock Land Banks

In addition to the system of twelve Federal land banks and the national farm-loan associations of borrowers, the act permits the establishment of joint-stock land banks and authorizes them to carry on the business of lending directly to borrowers on farm-mortgage security and issuing farm-loan bonds. These banks must have a capital of not less than \$250,000. They

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COME OFF-- RIGHT-CUT IS THE REAL TOBACCO CHEW, SO POKE YOUR OWN JAW.

WAIT, BOYS YOU'RE BOTH RIGHT-- W-B CUT IS LONG SHRED, RIGHT-CUT IS SHORT SHRED, BUT BOTH ARE THE REAL TOBACCO CHEW. NOW SHAKE HANDS.



YOU want to remember that the same fine stock is used in both W-B CUT and Right-Cut. The difference is that one is long shred and the other is short shred, both seasoned with a bit of salt. You will know *real tobacco satisfaction* when you cut out the old kind and take up either one of the Real Tobacco Chew twins. *A little chew lasts and satisfies.*

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are under the supervision of the Federal Farm Loan Board, but the Government does not lend them any financial assistance. The joint-stock land bank is free from many of the conditions imposed on the Federal land banks. Subject to the 50 and 20 per cent value limitation and the limitation as to territory, the joint-stock land bank may lend more than \$10,000 to a single individual, and it is not restricted to making loans for the purposes specified in the case of the Federal land bank. The joint-stock bank, like the Federal land banks, cannot charge an interest rate on farm mortgages in excess of 6 per cent, nor shall such interest rate exceed by more than 1 per cent the rate of interest paid by the bank upon its last issue of bonds. A joint-stock bank is limited in its bond issue to fifteen times its capital and surplus. Among the restrictions placed on these banks under the act are (1) that their mortgages must provide for an amortization system of repayment such as is prescribed in the case of loans through the Federal land banks, and (2) that they shall in no case demand or receive under any form or pretense any commission or charge not specifically authorized by the act and approved by the Farm Loan Board. The bonds of the joint-stock land banks are exempted from taxation. Their capital stock, however, is not exempted.

General Provisions

The law, through the Farm Loan Board, provides the necessary machinery for frequent examinations of the banks and the associations, for the proper cancellation of mortgages, and for the safe custody of mortgages offered as security for bonds. When any mortgage offered as security for bonds is withdrawn, the bank is required to replace the security with other mortgages or with other satisfactory collateral. Heavy penalties of fine or imprisonment, or both, are imposed for violations of the act, malfeasance in office, fraud, embezzlement, defalcation or other illegal practices.

Green weeds and summer grasses exhaust moisture from the orchard soil in a dry time; a mulch on the ground saves soil moisture.

Middle aged men who are not able to do hard manual work, but who must earn a livelihood, can make good money selling home orders of our Fruits, Flowers, Roses, Shrubs and Ornamental Trees. Farmers and Fruit Growers are getting the highest level of prices for their products in twenty-five years, and are going to improve their homes. Our best men are selling from \$500 to \$700 per week—average men from \$100 to \$500. **OUR NEW AGENTS CONTRACT IS A WINNER.** Write at once for territory. **PACIFIC NURSERY COMPANY, 122½ Grand Avenue, Portland, Oregon.**

Certified Potato Seed from Idaho

By E. P. Taylor, Field Horticulturist,
University of Idaho, Boise

IN Idaho the natural conditions surrounding potato growers are almost ideal. The soil in the principal potato districts of the state is a loose volcanic ash or a sandy loam and seems with average handling to be loose enough to allow the forming tubers to develop normally in all directions, resulting in potatoes smooth and free from objectionable knots and irregularities. The tubers produced are usually white and mealy and of excellent quality. The climate of the state also seems well adapted to potato growing. The seasons in sections are reasonably cool but long enough to allow the crop to mature. Coupling the ideal soil conditions with a congenial climate and adding to these an ample supply of irrigation water and good drainage, and it is apparent that the potato industry in Idaho has a firm foundation. But it requires more than good soil and climate and water to grow good potatoes from year to year in any locality. It takes thought and care. It has been found that potatoes grown upon the same soil continuously develop disease, and that without careful selection of seed the type is liable to degenerate and the yield fall away.

These are lessons that Idaho potato growers learned to a certain extent by studying the experience of potato growers in other large potato-producing states. Their own yields started downward, dropping from 10,000 to 12,000 cars per year to 7,000 to 8,000 cars. Federal potato experts warned them of the dangers surrounding disease, poor rotations and methods, and state agricultural authorities quickly united in the campaign for better potatoes. Be it said to the credit of an alert class of growers in Idaho, definite plans for potato improvement are now well under way.

One of the movements started by the Agricultural Extension Department of the University of Idaho has been the adoption of a plan leading to potato-seed certification. Such a plan has already been tried in Wisconsin and is working well. Idaho is the first state in the West or Northwest to put into effect such a plan, but this season about ninety separate growers have started into this work in a most thorough way, establishing potato-seed plats upon the cleanest, richest, most disease-free soil upon their places where soil, irrigation and drainage are the best possible. Upon these seed plats of from one to three acres each, only seed potatoes of perfect type and shape have been planted. This seed was selected as free as possible from all disease, including scab, Rhizoctonia and Fusarium wilt—these being the most prevalent potato diseases of the irrigated West. Every seed tuber was cut across the stem end for the detection of any internal vascular infection in order that these could be rejected. As a final precaution this especially selected seed was dipped with corrosive sublimate solution from 1½ to 2 hours. Four ounces of the



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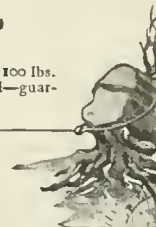
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can outpull 16 horses. Works by leverage—same principle as a jack. 100 lbs. pull on the lever gives a 48-ton pull on the stump. Made of Krupp steel—guaranteed against breakage. Endorsed by U. S. Government experts.

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Statement of the Ownership, Management, Circulation, Etc.

Required by the Act of Congress of August 24, 1912.

of "Better Fruit," Published Monthly at Hood River, Oregon,
for October, 1916.

State of Oregon, }
County of Hood River, } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared E. H. Shepard, who having been duly sworn according to law, deposes and says that he is the editor and business manager of "Better Fruit," and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, Better Fruit Publishing Company, Postoffice address, Hood River, Oregon.

Editor, E. H. Shepard, Postoffice address, Hood River, Oregon.

Managing Editor, E. H. Shepard, Postoffice address, Hood River, Oregon.

Business Manager, E. H. Shepard, Postoffice address, Hood River, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding one per cent or more of the total amount of stock.)

Better Fruit Publishing Company, E. H. Shepard, Hood River, Oregon.

3. That the known bondholders, mortgagees and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

(Signed)

E. H. SHEPARD,
Editor and Business Manager.

Sworn to and subscribed before me this 26th day of September, 1916.

(Seal)

ERNEST C. SMITH,

Notary Public for the State of Oregon.

(My Commission expires August, 1920.)

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poison being used for each thirty gallons of water. This treatment was given in spite of the fact that the corrosive sublimate was unusually high in price this season.

The seed selection and treatment was done in many cases for the growers by the field horticulturist of the Agricultural Extension Department or by county agricultural agents. Scores of public demonstrations by these officials were held, illustrating the proper methods in the leading potato districts. As a result these ninety or so select seed plats are under way and are being given the very best cultivation, irrigation and care. At blooming time the state or county agent will make inspections to see that odd varieties are culled out and that wilted or diseased hills are dug out and destroyed. Hill selection of seed from the extra high-yielding hills of good type from healthy vines will be made. After digging, a final official inspection will be made of the seed crop produced, and if it proves to be superior it will be covered by a state tag of inspection.

In this manner all growers participating will not only be raising the standard of their seed for their own planting, but if a surplus quantity of such certified seed is produced an outside market demand for Idaho certified seed potatoes will be developed. This will benefit both the buyer who wants seed of extra fine quality and the grower, who can readily command a premium upon such a product. This plan of seed certification is heartily endorsed by the United States Department of Agriculture, and Idaho is the first state of the Western States growing potatoes under irrigation to put such a plan under way.

The Agricultural Extension Department of the University of Idaho is guiding and establishing this work and will adopt measures to safeguard the use of these certificates upon potato seed either sold within the state or shipped out to other states for planting. Lists of the growers receiving certificates, giving their address and the variety of potatoes, will be published by the Extension Department and be given general distribution for the benefit of seed buyers both inside and outside the state.

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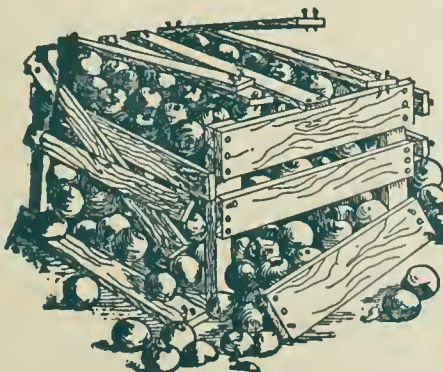
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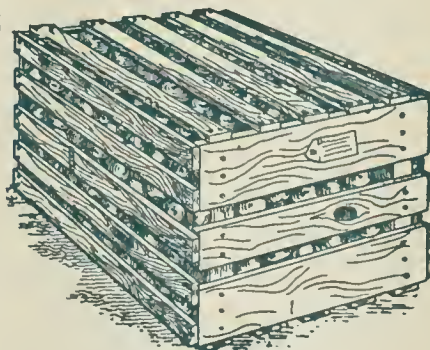
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BETTER FRUIT

VOLUME XI

NOVEMBER, 1916

NUMBER 5



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*An observation of interest to owners
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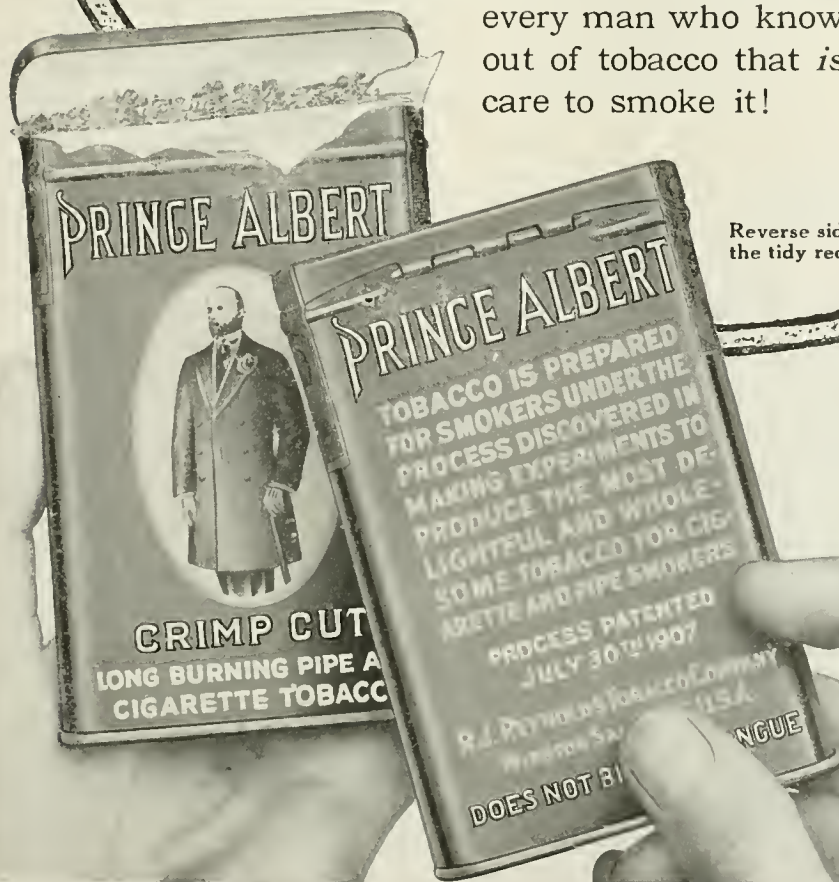
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Physical Handling of Fruit—Fruit Grades

By C. I. Lewis, Professor of Horticulture, Corvallis, Oregon

(Continued from last issue.)

GENERALLY speaking, the fruit growers of the Northwest have adopted three grades. These are termed Extra Fancy, Fancy and Choice. Occasionally a fourth grade known as "cookers," which is sold locally, is handled, and sometimes a special grade which would handle for fancy fruits which are otherwise perfect except for a little scab or a few hail marks. The tendency in this country, however, is to do away with the words denoting grades, and substitute therefor certain brands; such, for example, as the Blue Triangle as the best brand, Red Triangle as the second brand, the third grade generally being simply marked C. Experience seems to teach that this is pretty good practice. We have still, however, a big problem in determining the method of packing and handling our third grade fruit; in determining whether or not our system could be changed to advantage, or whether or not a different package than the regulation box could profitably be used.

A great deal of hard work has been done in the Northwest in the past few years in attempting to establish grading rules which will be accepted by all the communities. The problem has become greatly complicated, however, because there are about twenty varieties of apples commercially grown, and these grow to a different degree of perfection under various climatic conditions found in our region. It seems very desirable, however, that serious attempts be made to standardize the grades, and to see if it is not possible for the various fruit sections to come to a little clearer understanding on this subject. We all realize very keenly that we must absolutely maintain our standard or else go out of the apple business. The minute the Pacific Northwest lets down on its grading, troubles will begin to accumulate, and complications such as we have never experienced are to be expected. It may be found that with some varieties certain exceptions may be allowed. As an example we might come to an understanding as to the amount of scab to be allowed in a second grade pack of Yellow Newtowns. Shall we allow some scab or must such fruit be put up as a special pack? The consumers' tastes and desires on this subject should be worthy of consideration, and if the market will take a certain kind of fruit packed in a certain way and pay the price, and prefer it over the same varieties grown in other parts of the country, such a classification or grading certainly must be generally acceptable. For example, the English market, which con-

sumes the greater part of our Newtown crop, should determine to a large degree the grade and pack of that variety.

The Fruit Growers' Agency, Incorporated, is making a serious effort to help the growers of the Northwest in the grading of the fruit. A committee on physical handling of fruit has been appointed, which is as follows: S. V. Beckwith, Medford, Oregon; C. E. Chase, Walla Walla, Washington; Charles L. Hamilton, North Yakima, Washington; Sam G. Campbell, Hood River, Oregon. Advisory members: Prof. C. I. Lewis, Corvallis, Oregon; Prof. C. C. Vincent, Moscow, Idaho; Prof. O. M. Morris, Pullman, Washington; Prof. M. L. Dean, Missoula, Montana. All members of this committee will be delighted to hear from shippers, growers and packers of fruit concerning ideas as to improvements that could be made in the grading of our fruit. Whatever rules of grading are adopted must be practical working rules, which can be lived up to. It must be borne in mind that the buyer is going to hold the grower up to the grades he himself has adopted, and that if the Northwest adopts certain rules and regulations concerning the grading of fruit, the large buyers all over the world are going to reject or accept our fruit on the basis of our own advertised grading rules.

No system of grading which we may adopt will really be worth very much without a very efficient system of in-

spection. So far the states are acting separately along such lines. Some seem to have fairly good laws, and others not very good. Most of our money at present is spent in inspecting orchards, inspecting the fruit which is sold in our local markets, and in watching very carefully the interstate shipments of nursery stock and fruit which is to be handled for local consumption. All horticulturists realize that this is good work, but we are also beginning to realize that it needs to be greatly extended, and after all, as far as the horticulturists themselves are concerned, the success of the business and the greater aid will come from the inspection of the fruit shipped out of the state to the world's markets. If we can standardize the carloads of fruit shipped out it will do more to help the horticultural industry of the Pacific Coast than any other single factor. To inaugurate a system of inspection of this kind, however, means very close organization and considerable money. Just how this can be accomplished or what the machinery for handling such inspection will be are questions upon which the growers have not yet expressed their opinions. Some of the states of the East are passing laws to cover this subject. There are also national laws for barrel grading. California has made wonderful progress in the past year in the enactment of two laws. The first has to do with the standardization of fruit



FIGURE 2 A good type of cement and tile constructed house. Management is also making the best of advertising possibilities.

packing, and it is said that it helps the fruit industry of California more than any other single bill that has been passed in late years. This bill is mandatory. The second bill has to do with the packing of apples. This is entirely optional, but it undoubtedly will be accepted by a large number of the growers, and if it is, it will mean very much to the California apple. Possibly it will be impracticable for the horticulturists to try to pass through the Legislatures of the several Northwestern states this next winter laws and bills which will cover this point, because they will mean appropriations, and the spirit of the country has not been favorable to such appropriations. At least, they can only be brought about by very energetic work on the part of the fruit growers. They will have to show a keener interest than they have been showing in the past four years if such legislation can be brought about. Possibly the Fruit Growers' Agency may be able to get all shippers affiliated with this organization to agree to some efficient form of inspection. The system used by the Wenatchee-North Central Growers' League is one of the best which has been tried on the Pacific Coast. This inspection was conducted at an expense of one cent a box, and seems to have been very efficient. The great difficulty in carrying on inspection work seems to be finance on the one hand and maintaining the confidence of all parties on the other. Personally we believe that perhaps the



best results could be obtained if we had national inspectors, who were under the authority of the United States Department of Agriculture.

We are not going to attempt in this article to discuss packs and packages in detail. It is well to know, however, that the adoption of one package is a step in the right direction; also the

elimination of the offset and most of the square packs; and that limiting the number of diagonal packs to be used is very desirable. We have had a tendency to use too many packages and too many packs. This has complicated the situation and hasn't really helped us commercially in any sense.

Continued in next issue

Are We Growing Fruit Successfully?

By J. Howard Wright, President Washington State Horticultural Society

I BELIEVE there are certain facts that we have overlooked in figuring the reason why we have not been more successful in the fruit business. Too many of us are prone to lay the blame on the other fellow, believing that we have done all when we have delivered our crop ready for shipment to our marketing agency or to the cash

dealer. But have we? Are there not many things that we might have done that would have made better quality of fruit?

Now I am going to enumerate some of our faults as they seem to me. If I am too hard in some of my criticisms I hope you will bear with me and take no offense, for I am very much interested

in this business. Every dollar I have has been earned in it, every dollar I possess is still in the game, and I hope is going to remain there. One of the very worst things that ever struck the Northwest was the boom prices in fruit lands a few years ago, resulting in many people buying land at fabulous prices and setting to fruit. No doubt at the time the prices did seem reasonable when compared with the returns to growers in 1907 and in 1911. But we must remember that the tonnage moving from the Northwest at that time was very small and of course found very good prices; also times were very good then and people were ready to part with their money for big red apples. But at the present time conditions have changed very largely. Times are hard. A terrible war is on hand. Money is tight and people are not so willing to barter their money for a red apple. Consequently fruit lands have fallen in value, and on account of the planting of so many orchards the tonnage has increased immensely. Therefore we are not getting rich so quickly as in our dreams of a few years back. Sheriffs' sales, foreclosures and the like are the order of the day. Many people are condemning the fruit business and seeking some other means of getting rich quickly, and why?



FIGURE 11—Type of house being erected in Southern California by the orange growers. Note the large shaded loading platforms and also the provisions made for good ventilation in this building. Photograph by courtesy of Dr. Leon Batchelor, Riverside, California.

Thousands of acres of farm land suitable only for general farming have been set to fruit trees, with the result that rosette, root-rot, collar-rot, blight and many other diseases have destroyed and will destroy these trees. If you own orchards in such a location the best thing to do is to quit trying to grow fruit and grow something that will pay. No doubt you have paid a fruit land price for land suitable for growing hay, but charge this to experience. Fortunately nature has been very kind to the fruit grower in the Northwest in that no matter how he seemed to care for his orchard, yet he was able to reap quite a benefit from it. But that time has passed. Fruit tree diseases, insects and pests of various descriptions are now quite prevalent and the grower is kept busy from the beginning to the end of the season fighting them. It is absolutely necessary, in order for you to be a successful grower, to get right down to hard work and keep after it the whole year round. It is most necessary to give your time and attention to any and all of the various phases of fruit growing. Too many of us do too much of our orchard work by proxy, leaving the other fellow to do the work and then expect results. Nine chances out of ten we do not get them, and then we condemn the business, when as a matter of fact there is no one to blame but ourselves.

If you are not willing to go up against hard work stay out of the game. Do not maintain an orchard that is of no value to you and is a menace to the man who is growing good fruit. There are too many of them now. Every time you fail to spray or cut out blight lessens your chances of success and also that of your neighbor.

We will take the season just past. The complaint has been that there never have been so many worms and scale. True, we must admit that the season has been very favorable for them. But how many growers started out last spring with a determination to win at all hazards. I will guarantee that today that grower has no complaint on the net profits on his crop. Too many of us have been caught napping. Asleep at the switch. Start out at the beginning of the season with the idea that your orchard will bring you a million and that if you do not get in and work you cannot get it.

Along with my fruit growing I do some buying, and in canvassing a great many orchards in my locality I was struck with the evident lack of care so many of them had had. Very little pruning, poor spraying, no thinning. I lay this condition to several causes. One is that growers did not have enough money to give the orchard the care it should have had. Another, the growers had lost heart, and consequently had neglected to do things that they should have done, with the result that they are no better off than they were last year, when there was such an immense crop and no price.

Today go to your county and state fairs and look at the displays. Do you see a preponderance of fruit exhibits?

No. The exhibits run largely to livestock. Why? Because that business is more in the limelight for the reason that it appears to be paying better. But is that any reason for the fruit grower stampeding to that line of farming, giving up what he has learned by costly experience? Leaving the one at low tide and going into the other at high tide will never get him anywhere. If your location is right, stay with it. Some day the fruit will be back in its own and the other may be down. In 1896 a very large apple crop was produced, with the usual result—thousands of barrels went to waste; but in the course of a few years there was not such an overproduction, but rather the very reverse. What was the result? The man who stayed by his orchard, carefully tending it through the poor years, was in a position to take advantage of the better prices when they came. That time is going to come again in the apple game and it may not be so very far ahead. Better have your lamp trimmed and burning by having your orchard trimmed and sprayed.

In the management of all business there must be the greatest possible elimination of waste. How much do we as growers follow this idea? Do we clean cultivate our orchards year after year, destroying the humus in the soil without putting something back, thus starving our trees until we produce small, unsalable apples? Or are we seeding them to a cover crop, thereby putting humus and life into the soil, building it up, and thus giving the trees health and vigor? Humus is the yeast of the soil. Without it the soil is dead, of not much more value than so many ashes.

How many of us produce on our ranches as nearly as possible all the things that we eat, by keeping a cow or two, a few hogs, chickens, and maintaining a garden? Not too many of us. We should have all of these and should raise a crop of alfalfa to feed them. Besides, all of us have more or less waste in cull fruits. As there seems to be not much profit in a by-product, let us make a by-product of the hog. By feeding him this waste, together with green alfalfa and alfalfa hay, and purchasing a small amount of grain to go along with it, a pretty fair quality of pork can be produced at a profit. It beats 25 cents a pound for bacon. Another item: Hogs running at large in an orchard cannot be beaten as a means of fertilizing year by year. Year by year the population of this country increases and the demands upon our soil become heavier and the exports of foodstuffs become smaller. Our farms are becoming more and more subdivided, thus requiring more profits to the acre, as there are more individuals to support. With this idea in view, is it not very necessary that we keep our soil in prime condition? In talking with a fruit grower from Connecticut I was informed that the cost of preparing the land in order that alfalfa may grow on it is \$75 per acre. Think of that. Here in the Northwest all that is needful is to purchase the seed, sow it, water it,

and lo! we have a crop. Do we want our soils to get in such a condition that it will cost a small fortune to put them back to what they should be?

There was an extensive complaint the past season because of sunburnt fruit. Have you noticed that this happened largely in cultivated orchards, especially on light colored soils? The sun beating down on the ground and reflecting back up made heat strong enough to scorch the apples. However, this was not the only reason for sunburnt fruit. Trees that have been neglected by lack of pruning produced long willowy growths, and, overloaded as they were this season, lopped over the ground, exposing the fruit to the glare of the sun, with the result that the apples were ruined for market. Systematic pruning and thinning would have helped immensely.

We hear a great deal about the dishonest commission men. There are such men, and the manner in which the commission business is carried on gives them the opportunity. But what about the grower? Is he always honest? Not by any means. How many times will he bring in the fruit, the red apples on the top but not on the bottom of the box. It is a pleasure to do business with a grower who can be trusted. When he tells you that he has a box of Extra Fancy you may depend upon it that the apples are of that grade, and you pay him from 10 to 25 cents more per box than the man whom you must watch. The man who puts up his fruit right and sells it as represented is most likely the man who is growing his fruit right, and, as a whole, is a success in his line. Would that there were more of these people.

Right here is where I wish to criticize our laws made to regulate our business of raising fruit. Last winter at Olympia a great deal of time, energy and money was spent in getting a bill through that would protect the grower who would produce good, clean fruit. The Legislature passed the present horticultural bill. The honest grower was delighted, because he thought he would have ample protection against the man who grows worms and scale instead of apples. But has he had protection? No. Hundreds of ears of infected fruit have been shipped out of the state, helping to lower the price on the good. It is poor satisfaction to have spent long, tedious hours spraying, endeavoring to live up to the law as interpreted by our inspectors, and when the crop is ready to deliver find that his neighbor who did not spray is able to sell his crop, bugs and all, and possibly sooner than the man who puts his up right. Our horticultural commissioner tells us that it is only for this season, because of the scarcity of apples; but what about next year? Can the inspectors put up the bars next year after having let them down this year? I don't see how they can. The man who sprayed his crop this season because he thought he must will not be very much inclined to do so next season, after he has found that his careless neighbor who did not spray has been able to dispose of his junk this

fall. The only relief seems to lie in the direction of legislation by those states into which we are able to ship culls restricting the sale of same. I do not wish this to be construed to mean that I am condemning our inspectors, but I believe that a serious mistake has been made. Our inspectors as a whole are a conscientious, hard working lot of men, and growers should be in closer touch with them.

Another point I wish to make: The average grower, after he has produced a crop does not know what value to put upon it. He probably figures that he has paid so many hundred dollars per acre for his land, that it has cost him so many cents per box to prune, spray, harvest, pack and deliver, and so many cents for profit. This is perhaps as far as he has figured out what the price of a box of apples ought to be, or what he thinks it ought to be. He is very likely ignorant as to how many apples there are in other districts, or as to the condition of the crop in other states, which is information he should have in order that he may make his own deductions. It would seem that a man who produces an article ought to know something of what he might expect to get for that article when he puts it on the market. But many of us expect to get that much because the real estate man told us that we could get that much, at the time we bought our land, for we grow the only big apples. We should remember that the whole Northwest produces only a small percentage of the entire crop of the country. The average business man of the city meets other business men on the car going to his office, at luncheon, at clubs and in numerous other ways. Here they discuss business and each is benefited by the other's experience. It is not so with the farmer. He gets out early in the morning, goes to work in the fields, at noon he comes into the house and eats his dinner, and then returns to work. At night he comes in tired after his day's work and is soon off to bed. This may happen day in and day out. He stays so close to his duties that he loses touch with the world. Consequently he does not know what the other fellow is doing. Right here at this meeting there should be more growers to find out what the other fellow is doing. It would be far better for all of us to occasionally take a trip to the large centers in order that we may see how our produce is handled. It is a poor observer that would

not get his money back from such a trip.

We are told that as growers we need only know how to produce a crop and that it is not necessary for us to know anything about the selling end of it. Such advice is a good thing for the man who wants to be paid for his services in handling our crops. Watch the other fellow. If he is producing his crop at a less cost than you, get next to him and find out how he does it. Then go him one better if you can.

Although the fruit business is a very hazardous game, not only in the growing, but also in the handling, it is a very

interesting one. Let us all put our shoulders to the wheel. Let us put more energy and care into our pruning, spraying, thinning and packing. Let us bring our fruit up to the highest standard possible, making the box apple of the Northwest so superior to the barrel apple of the East that the freight rate will be no handicap to us. Success will be ours and the dreams of a few years back will become a reality.

[Note—The Washington State Horticultural Society will hold its annual meeting in North Yakima in December.]

California Walnut Grove Soil Management

By Dr. L. D. Batchelor, University of California Citrus Experiment Station, Riverside, California

A REVIEW of the methods employed by some of the most successful California walnut growers may be of interest to the readers of "Better Fruit." Clean culture is practiced in the great majority of the walnut sections of this state. The maintenance of sufficient soil moisture is an important factor and clean cultivation is one of the chief means of promoting this conservation. An increasing proportion of the growers are using winter cover crops as a means of keeping up the humus of the soil and adding nitrogen through the leguminous crops. *Melilotus indica*, field peas and vetch are among the leading crops used for this purpose. By seeding just before or immediately after harvest the above cover crops will be nearly waist high by the last of March or the first of April. At this time they may be either plowed under or disked. The disking usually requires the use of a small tractor or six to eight horses on an outfit, depending upon the soil conditions, crop, and size of implement used. In maintaining the humus of the soil the preservation of the walnut leaves is of great importance. In sections where the leaves are likely to be blown off the grove, furrows may be plowed between each row of trees and thus cause the leaves to bank up in drifts. Shallow cultivation is kept up periodically through the summer, especially after each irrigation.

The number of irrigations, amount of water applied and season of application vary widely, according to the natural rainfall, nature of the soil and general climatic conditions. Whereas the growers in some of the dry inland sections,

as for example the San Jacinto Valley, apply six or seven irrigations a season from April to October, other regions, as the Whittier district, may apply only one or two irrigations per season. Each grower must be a student of his own conditions. The trees should not suffer for want of water during the growing season, nor during the early winter before the rains begin. Groves which become too dry before watering in the summer are very apt to shed their leaves at harvest time and make the gathering of the nuts more difficult. Drying out the latter part of the growing season also seems to be one of the contributing factors which may cause the nuts to fall with the shucks on, and thus cause extra expense in harvesting. This trouble is more often encountered on sandy soils and on those underlaid with a porous subsoil, thus having a low water-holding capacity. Frequent irrigations, with only a medium amount of water, would likely be advisable on such soils. If the soil is excessively dry when the trees go into the dormant condition there seems more liability of winter-killing in the form of die-back in the tops of the trees. To prevent this many of the groves are watered the last of October or first part of November. Some years the early winter rains make this unnecessary, but this is hard to foretell. Two irrigations during the average growing season, one, say, the first week in July, and the other the third week in August, will be sufficient on the typical walnut soils, the deep, rich, heavy loams. It is seldom advisable to give anything but very general advice on the matter of irrigation.

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EVIDENCE

"In preparing the ground for the planting of trees the *Rural Press* recommends the use of powder." PACIFIC RURAL PRESS, San Francisco.

"We advocate the use of explosives for loosening up compact soils and hardpan in tree planting, knowing the value of such work." FANCHER CREEK NURSERIES, Fresno, Cal.

"The use of a good explosive is of great benefit in planting an orchard, as the ground should be loose enough to allow roots to go to their natural depth easily." BENEDICT NURSERY CO., Portland, Ore.

"We favor blasting holes for trees where the soil is heavy. Powder will loosen the soil, giving it a better chance to become aerated, as well as making it more retentive of moisture." OREGON NURSERY CO., Orenco, Ore.

"My orchard has made excellent growth, due to the fact that I used dynamite, breaking up the soil and making excellent beds for the roots. If I were to set another orchard I would not think of doing so without blasting each tree hole." T. A. JOHNSON, Boise, Idaho.

"We have used explosives in digging tree holes in the hard caliche subsurface layers which occur here. We find this cheaper than the use of pick and crowbar, and more satisfactory in that the soil is shattered deeper than the hole could be dug." GEORGE T. FREEMAN, Arizona Agricultural Experiment Station, Tucson.

"The use of Farm Powders in the orchard industry is rapidly being learned and appreciated. The *worst* looking orchard I ever saw, suffering from a lack of drainage, was blasted two or three years ago, and now it looks as fine as any other well kept orchard in this valley." E. H. SHEPARD, Publisher "Better Fruit," Hood River, Ore.

"We have observed many cases in which powder has been used for blasting beds for fruit trees, invariably with great success. The use of explosives is of material benefit when the soil is inclined to be rather shallow and underlain with a hard subsoil. There are few soils in which blasting cannot be done profitably." THE FRUIT GROWER, St. Joseph, Mo.

"I have done a great deal of orchard planting and use powder for making the holes. At first it was used chiefly on heavy hardpan or other soils that were difficult to prepare with the spade, but is now used on all classes of soil. I was planting trees even in light soil, easily handled. I should prepare all the holes with powder. Trees so planted make extraordinary growth." FRANK FEMMONS, Oakhurst, Cal.

"Generally speaking the growth of plants depends upon the condition of the soil into which the roots penetrate. If the depth of loose soil is too limited or the surface water is permitted to stand too long, the growth is impaired. Explosives properly used in such instances have invariably relieved the condition and resulted in excellent growth. The yield is often three times as great on blasted soil as from those untreated in the same vicinity." ROSECROFT NURSERY & FRUIT FARM, Sumner, Wash.

"The O'Connor prune orchard near Los Gatos in the Santa Clara Valley, California, was blasted in 1913. During the previous six years the largest crop was 3,000 pounds. In 1914 after the blasting, the crop was 8,000 pounds, more than double. It was a dry year, too. Where there were from 30 to 40 per cent. of 'drops' in the orchards on both sides, the O'Connor place lost only about 5 per cent. Prunes from the blasted orchard averaged much larger and the trees made a better growth and retained their foliage a month longer than the orchards on either side." JOHN A. GALPIN, Los Angeles, Cal.

"My orchard was planted three years ago and all trees were of even age and size. I intended to blast the whole orchard but ran out of powder and finished the small balance without it. This enabled me to compare the growth of the trees and satisfy myself that the expense was justified. The trees, that were planted in blasted ground show a growth of 75 to 100 per cent. over the trees that were planted in ground not blasted. They also appear healthier and more satisfactory in every way. I have just bought 1100 more prune trees and would not think of planting them without preparing the ground with powder." HERMAN H. SMIDT, R. 3, Oregon City, Ore.

is given by many fruit growers in the accompanying page from the Giant book, "Better Orchard Tillage." These men say that blasting

- enables the trees to root deeper;
- adds moisture storage capacity;
- saves labor and money;
- improves orchards that are not doing their best;
- is always profitable when properly done;
- places the soil in the ideal condition that permits newly planted trees to make extraordinary growth;
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Displacement of Horses by Tractors

[U. S. Department of Agriculture]

IN investigating the value of the tractor from the farmer's point of view specialists of the Department of Agriculture recently obtained from over four hundred owners of tractors in Illinois reports as to the number of horses which the tractor had enabled them to do away with in the farm work. The following analysis of about two hundred reports from typical Corn-Belt farms is taken from Farmers' Bulletin 719, "An Economic Study of the Farm Tractor in the Corn Belt":

Many men look to the tractor to enable them to do away with the use of horses for farm work, at least in great part. To date, however, the tractor has not displaced horses to the extent commonly expected by purchasers, but its greatest advantage, as before mentioned, lies in the fact that it does the heavy work quickly, and thus completes it within the proper season, since it places at the farmer's command a large amount of power when needed.

The tractor does displace horses to some extent, but only in about two-thirds of the cases where it is used on the same number of acres previously farmed. In these instances the horses displaced average only about four, and represent slightly less than 50 per cent of the cost of the tractor outfit. The number of horses displaced does not appear to vary to any great extent with the size of the outfit, about as many horses being laid off after the purchase of a small outfit as after buying a large one. The number will vary under different conditions, however, the principal influencing factor being the number of acres farmed per horse and the distribution of the work throughout the year.

In the Corn Belt horses are seldom displaced on farms where the average tilled acreage per horse is thirty or more. On the farms in Illinois where horses were displaced by the tractor, one horse had been kept for each twenty acres of tilled land. After the purchase of the tractor one horse was kept for each thirty acres of tilled land, or approximately the same as on farms on which no horses were displaced.

There is much work on most farms for which it is neither practicable nor profitable to use the tractor. This is especially true in the Corn Belt section, where cultivating frequently requires more power at one time than any other farm operation. Few if any tractors, according to reports received, are utilized for such work with entire satisfaction, and it is, therefore, necessary to retain a considerable number of horses after the tractor is bought.

A study of the distribution of horse labor on a typical Corn Belt farm indicates that the peak load, that is, the greatest amount of work, comes about the end of May, which is the season when corn cultivating is at its height.

On ninety-two Illinois farms where no change in the acreage was made after the purchase of the tractor, an average of twelve horses per farm had previously been kept. Two hundred and sixty-three horses were displaced on these farms, an average of not quite three horses per farm. On thirty-one, or about one-third, of these farms, no horses were laid off.

The raising of colts is an industry of considerable importance on farms in the Corn Belt, and it would seem natural to expect that where tractors were

bought and the work stock thus relieved of the heavy field work the percentage of brood mares kept would be increased and that the chances of raising more and healthier colts would be enhanced. It was found, however, that on a large group of farms in Illinois the brood mares constituted 33 per cent of the work stock before the tractors were bought, and while the work stock was decreased to some extent after the purchase of the tractor, the percentage of brood mares increased only 3 per cent, thus making the percentage now kept amount to 36 per cent.

Fruit Sun-Scald

Reports from various parts of the state indicate an unusually large amount of injury to growing fruit caused by sun-scald. It is probable that the trouble is so prevalent this season because of the sudden and extreme changes in the weather. When several cool, moist days are followed by high temperatures and high insolation the tissue of the fruit is likely to be so watery that the exposed outer cells are killed. This causes a discoloration of the skin and flesh on the sunny cheek of the fruit and destroys any hope of its ever developing to better than "cull" quality.

What to do to prevent such injury, or to reduce the loss to the minimum after the burning has taken place, is being frequently asked the Department of Horticulture of the State College at Pullman. Of course, the primary cause, the unfavorable weather, cannot be controlled. It is probable, however, that weak trees with sparse foliage are the ones on which the injury is most severe. This would indicate the need of nitrogen-gathering cover crops to improve the soil condition, thus causing the tree to make a better twig and leaf growth.

Since the burned apples cannot develop into good fruit, Professor R. J. Barnett recommends that they be removed from the tree by pulling or clipping, as soon as possible. The work of thinning would cost something at the time, but this expense would be largely balanced to the grower by the lessened cost of picking and sorting the mature fruit at harvest time. In addition, the fruit left on the tree would have increased chances to develop high quality, because of the lightened load. It is the number of seeds produced which represents most closely the tax on the tree of maturing a crop of fruit. Such a thinning may prove to be very valuable if it enables the tree to produce a larger crop during the season of 1917, a normally light fruit year.—Ira D. Cardiff, Director, State Agricultural Experiment Station, Pullman, Washington.

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Growing Cover Crops in Young Orchards

By J. A. Hughes, County Agriculturist and Collaborator, Omak, Washington,
United States Department of Agriculture

A WELL worked out system of cover crops plays two important parts in a young orchard: It builds up the soil by providing humus and other plant foods, and furnishes ready money or equivalent foodstuffs during the expensive and long interval between planting and bearing.

In most sections of the Northwest nearly all orchards planted are planted on virgin sagebrush land. Such land, being generally of volcanic or of glacial drift origin, is very fertile in all plant foods save nitrates and humus; and generally the only supply of such humus has been obtained by the growth of sages and bunchgrasses; as this supply is very limited, rarely lasting growing trees more than two years, the orchardist must provide his soil with this necessary plant food. In the rush and excitement of planting Western orchards many people did not even wait to properly prepare the soil; often strips of sagebrush would be cleared, holes dug, trees planted, and the ground not yet leveled or cleared of the brush between the trees. A lover of artistic swearing would enjoy being in the neighborhood when the first irrigation was being done.

In the Okanogan and Methow Valleys there are approximately 22,000 acres of orchard, the average age being four years since planting. The geological

formation of the entire country is of glacial and volcanic origin and very deficient in humus. Since this country has been recently watered, all of the orchards are very young. The three best orchards in the entire country are six years old and were planted on land which had been alfalfa fields for from ten to twelve years. The soil of these fields will be found to be very rich, easily handled and very fertile. The trees are of wonderful growth, producing heavy crops of very highly colored fruit. In one corner of one of these orchards no alfalfa had been grown, the land being broken up just before planting. The trees on this part are barely two-thirds as large as on the other, and have not produced more than

fifty per cent as much fruit. The entire orchard has been given the same treatment, yet the line showing where the alfalfa was grown can be distinctly followed by the difference in the growth of the trees. Many orchards which are kept clean cultivated and where artificial manures are not used grow well for several years, then they stop growing, become sickly, the trunks have a pale yellowish or reddish hue, the spurs and leaves are scant and small, the entire tree having a starved and retarded appearance. This is one of the indications that the store of humus has become depleted. In numerous instances I have found orchards side by side, one having been cultivated clean and with no application of manure, and the next one kept in cover crops; the clean cultivated one will be sickly, of scanty growth, often full of rosette, while the other will be

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very sturdy, of splendid growth and of much larger size.

In the Okanogan country the favorite soil building cover crops are alfalfa and clover. Thirty orchardists are now trying out sweet clover. The best stands of these crops have been secured where the land was first planted in rye, then about the middle of April or just when the rye is in the boot it is turned under,

and two weeks later the land is harrowed, the seed sown and then the first irrigation is given. Sometimes alfalfa is sown in the fall with rye, which is cut in the early summer for hay. The best results, however, have not been secured by this method. During the first six or seven years an orchard should never be sown solid to a heavy rooting cover crop; hundreds of or-

chards in the Okanogan country prove this. A strip at least five feet wide should be kept cultivated on each side of the tree, thus allowing room for the growth of the roots of the young tree. A heavy sod of alfalfa contains such numerous and strong roots that the young trees are choked when planted directly amongst alfalfa. I have in mind the condition of a certain twenty-acre orchard of seven-year-old trees; five years ago ten acres were sown solid to alfalfa and the other ten kept cultivated clean. At the present time the trees in the alfalfa are fully two seasons' growth behind those in the clean cultivated orchard.

The most successful way of handling the alfalfa cover crop is to use the first three cuttings for hay, leaving the fourth on the ground and disking it in in the spring. Where the season is not long enough to produce four crops, the third should be left on the ground as a fertilizer. A point to be remembered is that the cover crop must not be watered too late, as there is great danger of the trees suffering from winter injury by going into the winter in too green a condition. Last spring an orchardist became very irate when he heard me advocating the cover crop system. He said the alfalfa killed his trees. On visiting his orchard I found a ten-acre tract of Jonathans. Seven acres were cultivated clean and three were sown in alfalfa. In the part in alfalfa thirty-eight trees were entirely killed by winter injury, while in the clean cultivated part not a single tree was injured. He irrigated the last time in the clean cultivated part on the 29th of August, 1913, and the part in alfalfa received its last irrigation on the 23d or September of the same year. Numerous other instances have shown that great danger is incurred by the late irrigation of cover crops.

In the more sandy soils vetches have proven very satisfactory, but as the prices of this seed have become prohibitive very little will be used until they are cheaper. One of the greatest problems of Okanogan County is the sandy orchard problem; about 8,000 acres of



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land which is very sandy, almost entirely deficient in humus, has been planted in orchards. The water supply is limited to about two acre feet, which is barely enough for the growing tree. Sufficient manure is not available to supply the necessary plant food, and unless this is supplied the physical condition of the soil will become very weakened. It will become leached or burned out and the growth will cease. The application of commercial fertilizers in concentrated form may temporarily partially relieve this condition, but they never remedy it, and are too expensive for any orchard to afford where returns on investment are desired. The available amount of irrigation water is not sufficient to maintain a cover crop during the summer. This problem has been successfully solved by many orchardists who use the following system:

Rye is sown in the fall and plowed under in the spring while yet in the boot, the orchard is clean cultivated until the middle of August, when it is again sown to rye. This is repeated each year until the fifth year, when alfalfa is seeded in rows two and a half to three feet apart. The alfalfa is kept cultivated between the rows for the first year, thus conserving a large amount of moisture. By the end of the second year a solid sod has formed. The rye builds up the soil sufficiently to hold the scanty amount of irrigation water until the alfalfa obtains a foothold. Where this system has been practiced the orchards appear as oases in a desert, among the other orchards which are clean cultivated. Last summer two orchards where the soil was very sandy yielded four tons of alfalfa per orchard acre and the trees are in splendid condition, comparing very favorably with

those in loamy soil; and in that section alfalfa hay sells for eight and ten dollars per ton. The texture of the soil is so improved that it retains moisture far better than the original and sandy soil. The two acre feet of water seem to go just as far in those orchards as in others where only the sheer sand is found, and the trees are more than twice as large.

Continued in next issue

Railway Wants All Space in Cars Utilized.

The Great Northern Railway is appealing to the apple shippers that they load cars with more than the minimum 630 boxes, to mitigate the car shortage. Nearly every car now rolling is loaded five tiers. The railway feels that by extra effort the cars can be loaded either six or seven tiers high. A tier consists of 126 boxes. The railway feels that if the shippers load heavy, whenever the buyers will permit, it will help the situation considerably. — Wenatchee Advance, October 19, 1916.

Apples Go Abroad.

Washington apples comprise one of the large items of the cargo of the O. S. K. steamer Tacoma Maru, which sails from Tacoma to Manila this week. The consignment amounts to 1,500 boxes, most of which are from the Yakima district. The fruit is consigned to American firms in Manila who have a large number of former Pacific Coast people as their customers. They are anxiously awaiting the arrival of the Washington product. The apples will reach the consumers in time for their Thanksgiving dinner.

The Okanogan Valley of British Columbia is shipping fifty carloads of apples to Australia and New Zealand this fall. It is also sending its product to Europe, Asia and Africa.—Wenatchee World, October 19, 1916.

Northwest States to Co-operate With Federal Government.

A committee of nine, three each from Washington, Idaho and Oregon, will be immediately appointed by Governors Lister, Alexander and Withycombe to draft a plan by which the executives of the three Northwestern states may co-operate with the Federal Government, acting through its Office of Markets, to promote a wider demand for Northwestern apples. This was the result of the conference called by T. O. Morrison, head of the horticultural work in the State of Washington, and attended today by the three governors, fifty growers and shippers of the Northwest. Paul Weyrauch, president of the Fruit Growers' Agency, Incorporated, which was formed to further the Government plan, opened the conference and then retired in favor of Governor Lister, who presided. George T. Reid, assistant to the president of the Northern Pacific Railway Company, urged united action by growers and shippers of the three

We're Shipping Trees Now

Standard pears, apples, cherries, prunes and apricots are moving out in commercial quantities. Never grew better trees than this season; clean, well matured, splendid roots, stout bodies, grown on the far famed Yakima Reservation on clean, new volcanic ash soil.

Vrooman Franquette English Walnuts grown and sold under license from Oregon Nursery Company, owners of exclusive propagating right.

Shrubs, vines, shade trees, roses, perennials and other ornamentals.

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We ship everywhere, freight prepaid.*

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Salesmen Everywhere—More Wanted

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Soon open for engagement. Can handle any orchard or farm proposition, the larger the better, successfully, that has the rudiments of success in it. Address K. L., care "Better Fruit."

Wanted Experienced man to take charge of fruit farm of 80 acres, near Wenatchee; all in bearing trees, mostly apples. Must be married man and must thoroughly understand pruning, irrigation, etc.

Apply Box 2202, Spokane, Wash.

states to secure a standardization pack and pledged the support of the company to carry out the plan of co-operation along lines the committee may suggest. All agreed that judicious advertising was the key to the problem. Governor Alexander suggested that the situation might warrant the executives asking their Legislatures to make appropriations for advertising purposes. Alexander proposed the slogan, "As yellow as an orange, as pretty as a peach and as healthful as an apple." — Wenatchee World, September 22, 1916.

BETTER FRUIT

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Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Varieties and Grades That Do Not Pay.—For many years different districts and different growers in different districts have been producing varieties that do not pay the cost of production, and in addition shipping out grades of some varieties that do not pay the freight. It is also true that many apples have been shipped of some varieties that were too small to be of any commercial value. These are serious matters and deserve the attention of every fruit grower of the Northwest. When a fruit grower ships fruit that does not pay the cost of harvesting and transportation he not only does not make money, but crowds the market with undesirable stuff which prevents getting satisfactory prices on good grades and good sizes, pulling down the prices by crowding the market with undesirable grades and sizes. It is understood this subject will be discussed at the National Apple Show. Every district should collect data from their shipping association and selling concerns in the way of prices obtained on poor varieties, low grades and small sizes, and present them at this meeting, so that all growers who are not well informed can get the benefit of this information. Every association and shipping concern should have some man in their office prepare this data in typewritten form ready to be delivered when the discussion on this subject takes place at the National Apple Show in November.

The Washington State Horticultural Society meeting will be held in North Yakima January 3, 4 and 5. Washington is the largest fruit-producing state in the Northwest. Yakima and Wenatchee are two big districts, and both should be well represented. In fact, all districts in the State of Washington should attend the State Horticultural meeting, because every subject of vital importance in growing, producing and harvesting fruit will be up for discus-

sion. In all probability there will be addresses on Marketing, Advertising, etc., which will be of inestimable value. The program has not been completed, therefore we are unable to publish it in this edition, but we hope to be able to have it appear in the December issue.

The Ninth National Apple Show at Spokane is going to be one of the greatest events in the history of the Northwest, on account of the splendid program arranged. Practically every subject of vital importance before the fruit growers will come before the conference which is to be held, which will be followed by a general discussion. The program is so important and the problems coming up for discussion so important that every fruit grower that can get away to attend the Apple Show should do so without fail. The expense will be small, the benefit large, and the volume of information to be obtained of inestimable value. Probably one of the most important subjects will be Marketing; another will be Advertising. It is to be regretted that a complete program has not been printed to be published in this edition, but take the word of the Editor of "Better Fruit"—this will be the best program that has ever been scheduled by the National Apple Show of Spokane for the benefit of the fruit growers.

Apple Prices.—Apple prices are running fair, but many growers will probably be disappointed, as the prevailing prices are not running as high as growers anticipated. This is to be regretted, as the apple growers need the money. Many will be unable to harvest their entire crop on account of early maturity, much of it dropping, which will shorten up the actual shipments. The lack of cold storage facilities has compelled growers to push their fruit on the market as fast as cars were obtainable. When markets are crowded the influence is demoralizing on prices, and lack of cold storage facilities in the West and the lack of proper distribution in the East and shortage of cars are all to be regretted, but having been unavoidable we must profit by this experience and be more fully prepared in future years.

The Oregon State Horticultural Society will hold their annual meeting early in December, the date to be given later. The Oregon State Horticultural Society meetings have always been well attended. They have had excellent programs and the information furnished in the addresses and discussions that follow each address has been of inestimable value to the fruit industry of the State of Oregon. The problems this year are many and complicated, more serious than ever before, which makes it all the more important for every fruit grower in the State of Oregon to attend the State Horticultural meeting.

Thanksgiving comes in November. The fruit grower is thankful for what he will receive, but would be more thankful if he received better prices.

The apple crop in the Northwest is the largest in the history of the business, in fact it is unexpectedly large, and is really the first experience the Northwest has had in handling an immense crop. While the growers will suffer considerable loss from not getting their entire crop harvested, as the apples matured very early, and there has been a shortage of help, they will learn a lesson and in future years will be prepared to meet such conditions if they occur again.

Harvesting Season.—Harvesting the 1916 crop has been a serious problem with all fruit growers of the Northwest. Growers were badly handicapped by the scarcity of men for harvesting. The situation was made more serious by the crop overrunning the estimate, and growers had not ordered enough boxes to handle the crop, which was further complicated by a shortage of cars. Late orders for cars of boxes were more or less delayed. The wrapping paper became exhausted, the supply originally ordered being inadequate, and added to these complications the fruit industry of the Northwest has suffered severely from not having experience in handling a large crop.

Yakima Valley Total Apple Crop.

Leading fruit growers and shippers agree that the Yakima Valley will harvest from 6,500 to 7,000 carloads of apples this fall, and while there is considerable difference of opinion regarding how the crop will grade and the prices which probably will be obtained, estimates indicate the crop will have a value of approximately \$4,000,000. The season has been short, spring having been two weeks late, and for this reason there will be many undersized apples, which necessarily will have to be sold at "C" grade prices, increasing the proportion of that grade to 25 per cent of the whole crop. Of the remaining 70 per cent about 40 per cent will be Extra Fancy and 35 per cent Fancy. The indications now are that only the better-keeping varieties will be stored.—Packer.

Everbearing Strawberry Plants

Superb Variety. Will bear from June to November, of large, sweet, red berries, very solid and productive.

Send for descriptive circulars.

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The New Patented Harvey Bolster Springs are made just like the finest automobile springs. They absorb all the bumps, jars and jerks of rough, uneven roads, and change an ordinary wagon into an easy-riding spring wagon. A set on your wagon will enable you to get your perishable produce to market in first class condition always. Insist on Harvey's. If your dealer can't supply you write us for free catalog and price list.

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Beans An Important Crop

The writer has received reliable information that the demand for beans for export during the past eighteen months has absorbed all beans obtainable, from one end of this country to the other. Even the normal demand for beans for the next twelve months cannot be supplied, and the added call, occasioned by the European war, will tend to make the demand even stronger. This is the year when a farmer with several acres in good tilth will do well to plant this crop. Beans contain as much protein as meat, and because of their low cost, palatability and high food value they have become an important article of daily diet for the soldier at the front, for the prisoner in confinement, among all nations, and it is impossible to overestimate their present export value. Today wholesale dealers are offering four and five dollars a hundred, in earlots, for beans. Our annual supply in the United States is from five to seven million bushels only. This is

hardly enough to supply home consumption, to say nothing of the present enlarged export demand. The great majority of the beans of the nation are grown in Michigan, New York, California, while Maine, Wisconsin, Ohio, Pennsylvania, Iowa, Florida, Virginia and West Virginia are important bean growing states.

The average yield, taken by the United States Crop Statistics Department, is 600 pounds to the acre. Under irrigation, in Colorado, as high as 1,000 to 1,500 pounds per acre have been obtained. A person who will cultivate his beans as he would his corn, planted on anything like reasonably good soil, should be able to obtain from 900 to 1,200 pounds per acre. The market will justify him counting on obtaining better than four cents per pound, or four dollars per hundred. This crop should not be planted until all danger of frost has passed, and great care needs to be given to irrigation of the crop. Consult your county agent or the State College crop man, in reference to both proper cultural methods and irrigation for this crop. Choose that type which your local seed dealer or the special crop man of the college recommends as best adapted to your locality and local market.

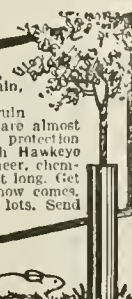
The principal thing is, plan first of all to plant at least a few acres as one side line cash crop. Second, plant in rows sufficiently wide for use of a horse cultivator. Third, keep the crop growing vigorously from the start. Fourth, har-

vest in the irrigated section early in the morning, before the intense rays of the sun render the pods so dry that the beans sell badly. Do not harvest in the field during the heat of the day. The crop should be allowed to come to full maturity, to prevent any shrinkage of the bean. Mexican beans, the Martha Washington (a type of small navy bean) and the kidney bean seem to be Western favorites. The amount of seed required to plant an acre varies with the variety, from forty to seventy-five pounds. Probably the best harvest returns have been obtained when beans were planted in drills rather than hills. For this an average grain seeder can be used for planting, stopping up as many seed tubes in the grain seeder as you

Hawkeye Tree Protectors

Sure,
Certain,
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One rabbit in a single night can ruin many trees. Trees only girdled are almost worthless. Get dollars' worth of protection at a fraction of a cent cost with Hawkeye Tree Protectors. Made of elm veneer, chemically treated. Easily put on, last long. Get them on your trees before the snow comes. 1c each in 100 lots; 3c in 1000 lots. Send for circular and sample.
Burlington Basket Co., 118
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55 inches wide
12 horse power at
the drawbar

20 horse power at
the belt

The powerful little
bull-dog of
tractors made for
service on the
smaller acreages
and especially for
cultivating

Asparagus

Hops

Grapes

Beets

It is narrow enough
to go between
the rows

It has no equal in
the vineyard—it
hugs close to the
trees—goes under
the limbs—turns
in short space—
doesn't pack
the ground

The ball tread
track is 13 inches
wide—it is power
in compact form



Asparagus

The banked-up
rows are narrow—
and soft earth—
the 55-inch Yuba
is the only
machine suitable
for the purpose

Hops

Economy calls
for narrow rows—
there's where the
Yuba works

Grapes

Here's the machine
for vineyards

Beets

The narrow Yuba
helps the beet
grower make
money

Write

The Yuba
Catalogue and
Fall Bulletin will
be sent upon
request.

THE YUBA CONSTRUCTION COMPANY

Department E-501

SAN FRANCISCO

find necessary to give the average width for successful cultivation. The seed should be planted medium shallow, with just enough dirt to cover to give a moist seed bed and insure quick germination. One of the requirements of a good bean crop is quick, sturdy germination, producing a good stand.

The writer believes that beans can be successfully cultivated and irrigated in rows twenty-eight inches apart. It is to be hoped that in small orchards where trees have not yet come into bearing, ground can be occupied between rows with this crop, without injury to the trees and with profit to the grower.—W. H. Olin.

Apples Should Not Be Wasted

[Robert Livingstone, Portland, Oregon,
in Wenatchee Advance.]

I am writing to draw your attention to the large quantity of good fruit which is yearly allowed to waste for want of a market. Last year my crop was light, being only 8,000 boxes from a thirty-acre orchard. Much of it was hail pecked and below grade, and my year's work resulted in a considerable loss. I dumped a carload of apples into the river because they could not pass inspection.

This year my crop is larger, and I have already two carloads of apples which cannot pass inspection because of worm stings, limb bruises and sun scald.

I am thoroughly in accord with the men who wish to maintain the highest standard for Wenatchee apples. But my apples which cannot be placed in any one of the three grades are good apples and could be used for cooking purposes or for eating. Under the present strict regulations I must allow these apples to waste and rot or destroy them in some way.

Now there is something wrong here. Could the rules not be modified so as to allow me to dispose of that fruit in some way? Could it not be marked and sold as low grade fruit? Much of it is so slightly damaged that it would find a ready sale in the poorer districts of the large cities at a small price.

I would gladly donate to charitable institutions my apples that will not pass the inspectors for the ordinary market, and would be willing to pay the freight on it to Portland or Seattle. I am interested in a charitable society in Portland called "The Men's Resort," and we take care of thousands of laboring men during the wet winter months who cannot find employment. It would be a splendid thing if I could donate to that society a few hundred boxes of the apples which I have to throw away. But under the present regulations I cannot do this.

In Great Britain large quantities of good butter are imported every year from Denmark. But much inferior butter is manufactured in England, and it is sold cheap and is called "Oleo Margarine," and the boxes are stamped accordingly. An infringement of the law in this regard is punishable by a severe fine. Now why could not the fruit grower be allowed to stamp and sell his cull apples as "Inferior Grade,"

or under some other name? Anything rather than total destruction of what is really good and wholesome food.

Fruit growing has not been a profitable business for the past three years, and the rules of inspection should help the fruit grower to get all he can out of his crop.

Some way should be available in Wenatchee for utilizing the cull apples. There should be a cider or vinegar factory, and there should also be a plant for drying apples and supplying the markets with this class of by-products.

This subject is of great importance and deserves the attention of your readers.

Protecting Trees from Mice

With the coming of winter and the possibilities of deep snow we should immediately turn our attention to the protection of young trees from the ravages of the field mice. The work of this little animal is greatest in hard winters with deep snows, and the results are many times not detected until we begin spring work in our orchards. They gnaw the bark and often girdle the trunk just at the surface of the ground, making bridge grafting necessary to save the life of the tree. A clean, tidy place harbors few mice, and so it should be with our orchards. See to it that tall grass, weeds and other annual growths which become lodged about the trunks of trees are removed. They make an excellent harbor in which these little animals like to spend the winters.

Cover crops are inductive to the habitation of mice, especially clover and alfalfa, where they are sown in solid blocks throughout the orchard and allowed to grow to a considerable height. A good plan is to mow down the dead stalks for three or four feet around the base and rake it back, leaving the ground clean next to the tree. After the first snow falls, tramp firmly close about the trees, thus compacting the grass so mice cannot find shelter underneath. Another plan that works well where mice are numerous and liable to do damage is to mound up earth around the body of the trees to the height of six to ten inches. This should be removed in the spring after all danger of attack has passed. Border fences of rocks, shrubbery and hedges are excellent harbors for mice. Here they can find shelter and a safe breeding place. The only method to pursue in this case is to plan for their destruction by the use of poisons or repellant washes put on the trunks of the trees.

Methods of Destruction — (1) Wash the trees with some persistent substance in which is placed paris green. Maynard recommends the use of portland cement the consistency of common paint for holding the poison, and applying to trunks of trees with a stiff brush. (2) Strychnine is the most satisfactory poison for field mice. Although a deadly poison and dreaded by many people, yet with the proper caution it can be safely used. Various baits can be used with it, such as wheat, cornmeal, oatmeal and bran. The bait should be

The Cleanest Apple Crop

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GROWN IN

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Was sprayed with the

*Sulphur and
the Miscible Oil
Sprays*

**Lime-Sulphur
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Arsenate of Lead**

Our Sprays are used and endorsed by the Hood River Apple Growers' Association and the Hood River Experiment Station.

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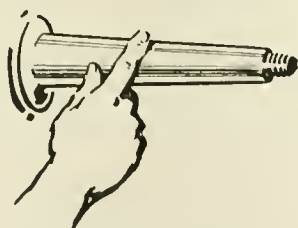
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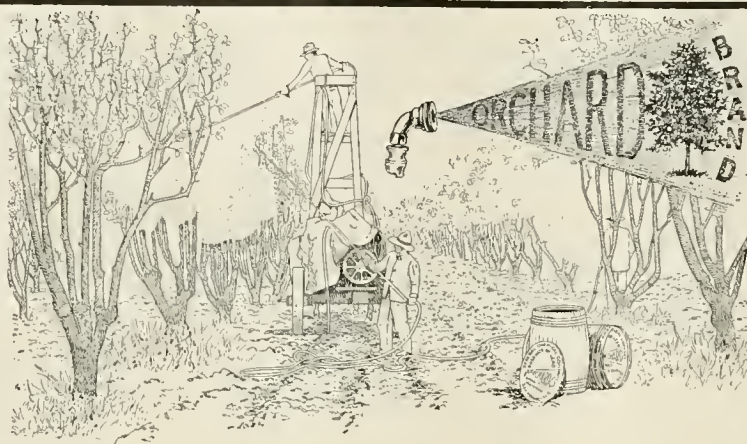
—when you use Mica Axle Grease. The grease is always evenly spread and it *lasts*. Mica Axle Grease would still be good grease even if it contained no powdered mica. But the mica makes it even better. Gives extra lubrication—forms a smoother surface—makes the grease last twice as long. Get a can from your dealer today.

Standard Oil Company
(California)

MICA AXLE GREASE

soaked overnight in a poison syrup which may be prepared as follows: Dissolve an ounce of strychnia sulphate in a pint of boiling water, add a pint of thick molasses syrup and stir thoroughly. A few drops of oil of anise may be added to scent the syrup. While hot, pour over one-half bushel of one of the above mentioned baits and mix thoroughly; if too wet, add a little more of the dry material to take up excessive moisture; if not wet enough, add warm

water until the mixture is all wet. There should be moisture enough to wet every particle and yet not enough to make it sloppy and cause dripping. Let the poisoned bait stand over night. Then apply in small bits with a spoon or small paddle in obscure, sheltered places where the farm animals and birds cannot get it, because of the danger of poisoning them.—C. B. Sprague, Assistant Horticulturist, Washington State Agricultural Experiment Station.



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S. W. Foster is the man in charge of the Insecticide Department of the General Chemical Company of California.

The purpose of this Department is to help fruit growers by giving them scientific and practical information concerning orchard pests.

Mr. Foster is a trained entomologist, graduate of Eastern Universities, whose six years' experience in the U. S. Department of Agriculture, five of them on the Pacific Coast, equip him to render expert assistance to you.

The services of this bureau of information are at all times available to you personally.

Call on him for any help you need—it is free.

Orchard Brand products have become the standard spray materials. They are made from exact scientific formulas to produce the most efficient results.

Bordeaux Mixture

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Dormant Soluble Oil

Atomic Sulphur

Lime Sulphur Solution

If you have any orchard insects or diseases write Mr. Foster, giving him a full description of the pest condition and he will tell you what to use and how to use it.

Orchard Brand products can be obtained from the following dealers:

GILBERT & DEWITT, Hood River, Oregon.	MORGON, McKAIG & CO., North Yakima, Washington.
BALFOUR, GUTHRIE & CO., Portland, Oregon.	WELLS & WADE, Wenatche, Washington.
C. J. SINSEL, Boise, Idaho.	SAMUEL LONEY & CO., Walla Walla, Washington
ROGUE RIVER CO-OPERATIVE FRUIT GROWERS' ASSOC., Medford, Oregon.	McGOWAN BROTHERS HARD- WARE CO., Spokane, Washington.

Attend to Your Orchard Spraying Now

General Chemical Company, San Francisco, California
Department F1

Some Apple Movement.

The total shipments from the Northwest now are 3,560 cars, just ten less than the number on the corresponding date last year. Shipments for Saturday and Sunday aggregated 385 cars and were billed to 100 points in 36 different states, showing the wide distribution that is being made this season. Chicago received the greatest number, 54, and New York was second with 35. The market continues in an even course, from the prices given in the daily government report. Jonathans are hanging around \$2 the box, and Grimes Golden about 25 cents less. These two varieties comprise the bulk of the sales, with sprinklings of Winter Bananas and Rome Beauties. Barreled Winesaps are now moving on the markets and are selling from \$3.50 to \$5.—Wenatchee World, October 17, 1916.

Northwestern Apple Distribution

[Editor's Note—"Better Fruit" has compiled statistics from the report of daily shipments from the Office of Markets of the Department of Agriculture, co-operating with the Fruit Growers' Agency, from the daily sheets issued. This report appearing below shows the total number of shipments of apples, in carloads, to every city reported, from October 1st to 26th. This report contains much valuable information and is mighty good evidence of the wide distribution of Northwestern apples.]

Austin, Tex.	2	Castleton, N. D.	1
Aberdeen, S. D.	23	Chester, Mont.	2
Amerillo, Tex.	2	Colt, Pa.	1
Anaconda, Mont.	2	Creswell, Oregon.	1
Arkansas City, Ark.	2	Conrad, Mont.	1
Albert Lea, Minn.	7	Centralia, Wash.	1
Alliance, Neb.	2	Clinton, Iowa.	2
Ardmore, Okla.	1	Carthage, Mo.	2
Aneta, N. D.	1	Carter, Wyo.	3
American Falls, Ia.	4	Cardston, Alberta.	1
Albuquerque, N. M.	1	Columbus, Neb.	2
Altus, Okla.	1	Corning	1
Akron, Ohio.	1	Columbus, Okla.	1
Bradstock, N. D.	1	Corpus Christi, Tex.	1
Burt, N. Y.	8	Culbertson, Mont.	1
Beaumont, Tex.	3	Camrose, Alberta.	1
Brownwood, Tex.	1	Cook, Neb.	1
Bisbee, Ariz.	2	Carbury, N. D.	1
Bismarek, N. D.	30	Cle Elum, Wash.	1
Baltimore, Md.	107	Casper, Wyo.	5
Boston, Mass.	191	Canora	1
Beatrice, Neb.	2	Chinook	1
Billings, Mont.	28	Council Bluffs, Ia.	2
Buffalo, N. Y.	22	Chateau, Mont.	1
Beach, N. D.	4	Cozad, Neb.	1
Buhl, Idaho	1	Crete	1
Birmingham, Ala.	5	Detroit, Mich.	25
Burlington, Ia.	2	Davenport, Iowa.	2
Butte, Mont.	25	Duluth, Minn.	101
Boise, Idaho	18	Des Moines, Iowa.	26
Bowman, N. D.	1	Durant, Okla.	1
Bridgeport, Conn.	5	Dallas, Tex.	37
Bellingham, Wash.	1	Dickenson, N. D.	3
Basin, Mont.	1	Denver, Colo.	39
Bonham, Tex.	1	Denison, Tex.	6
Bangor, Me.	1	Devils Lake, N. D.	2
Bozeman, Mont.	1	Diamondsville, Wyo.	1
Bingham, Neb.	1	Deadwood, N. D.	2
Bird Island, Minn.	1	Dubuque, Iowa	2
Brookings, S. D.	2	Drake, N. D.	1
Battleford, Sask.	2	Denton	1
Bent, N. Y.	1	Douglas, Ariz.	1
Burke, N. Y.	1	Donnelly, Idaho.	1
Belfield, N. D.	1	Deterick, Idaho.	1
Brigham, Utah	1	Delhart, Tex.	1
Brawley, Cal.	1	Eau Claire, Wis.	2
Brush, Colo.	2	El Paso, Tex.	23
Bend, Oregon	1	Edmonton, Alberta	15
Burley, Idaho	2	Edgeley, N. D.	2
Rox Elder, Mont.	1	Evansville, Ind.	2
Baker, Oregon	1	Enid, Okla.	4
Blackfoot, Idaho.	1	Erskine, Minn.	1
Carrington, N. D.	1	Everett, Wash.	3
Chicago, Ill.	510	Edenburg, N. D.	1
Curro, Tex.	2	Elmira, N. Y.	5
Cuthank, Mont.	51	Elgin, Ill.	1
Cheyenne, Wyo.	22	Emmett, Idaho	1
Concordia, Kan.	2	Eureka, S. D.	1
Cresco, Iowa	1	Fresno, Cal.	1
Coffeyville, Kan.	2	Fort Worth, Tex.	21
Calgary, Alberta.	3	Fargo, N. D.	14
Cincinnati, Ohio.	17	Fort Dodge, Iowa.	2
Cleveland, Ohio.	15	Freeport, Ill.	5
Cushing	1	Fremont, Neb.	1
Corsicana, Tex.	1	Fort Clark, N. D.	1
Columbus, Ohio	6	Fryberg, N. D.	1
Cedar Rapids, Ia.	2	Flaxville, Mont.	1
Crookston, Minn.	8	Farmers City, Ill.	1
Crawford, Neb.	6	Fort Smith, Ark.	1

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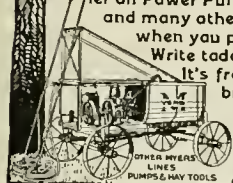
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Fairview, Okla.	1	Middleton, Idaho	1
Fulton, S. D.	1	Meyronne, Sask.	1
Grafton, N. D.	1	Memphis, Tenn.	2
Gull Lake, Sask.	1	Marshall, Tex.	1
Great Falls, Mont.	13	New York, N. Y.	613
Grand Forks, N. D.	11	N. Yakima, Wash.	2
Glenwood, Minn.	2	New Orleans, La.	33
Glasgow, Mont.	9	North Platte, Neb.	2
Glendive, Mont.	4	Norfolk, Neb.	3
Great Falls, Mont.	6	Norfolk, Va.	16
Groton, S. D.	3	Nashville, Tenn.	1
Greenville	1	Nampa, Idaho	11
Graw, Iowa	1	New England, N.D.	1
Gr. Rapids, Mich.	2	New York Harbor	1
Grand Island, Neb.	6	New Salem, N. D.	1
Garriso	1	Northgate	1
Guernsey	1	Nacodoches, Tex.	2
Grace, Idaho	1	Norton, Kan.	2
Galveston, Tex.	3	Norcat, Kan.	1
Golden Falls, N. D.	1	Oshkosh, Wis.	1
Garrison, Mont.	1	Olympia, Wash.	20
Goddard, Minn.	1	Omaha, Neb.	202
Granum, Alberta	1	Ottumwa, Iowa	5
Gillette, Wyo.	2	Oakes, N. D.	2
Glenwood, Minn.	1	Ogden, Utah	9
Glens Ferry, Idaho	1	Oklahoma City, Ok.	9
Gooding, Idaho	1	Orionville, Minn.	2
Globe, Ariz.	1	Onaga	1
Goodland, Idaho	1	Oakland, Cal.	1
Gilman, Mont.	1	Ontario, Oregon	1
Geneva, N. Y.	1	Philadelphia, Pa.	93
Glennallen, N. D.	1	Pocatello, Idaho	8
Hardin, Mont.	2	Portland, Oregon	10
Houston, Tex.	17	Puyallup, Wash.	1
Hutchinson, Kan.	3	Pittsburg, Pa.	20
Havre, Mont.	4	Phoenix, Ariz.	2
Helena, Mont.	7	Parsons, Kan.	1
Hastings, Neb.	2	Peoria, Ill.	9
Harlem, Minn.	1	Providence, R. I.	7
Hartford, Conn.	1	Pendleton, Oregon	3
Hoquiam, Wash.	3	Portland, Me.	2
Hanna, S. D.	1	Pueblo, Colo.	4
Hebron, N. D.	2	Payette, Idaho	8
Hunter	1	Pr. Albert, Alberta	1
Hilger, Mont.	1	Pittsburgh, Kan.	1
Hysham, Mont.	1	Potts, N. D.	1
Haley, Idaho	1	Ponlar, Mont.	1
Heltinger	1	Pendleton, Oregon	2
Hemingford, Neb.	1	Proctor	1
Haynes, N. D.	1	Ritzville, Wash.	1
Huntington, Oregon	3	Regina, Sask.	12
Howard, S. D.	1	Rockford, Ill.	1
Hope, N. D.	1	Rugby, N. D.	5
Indianapolis, Ind.	13	Racine, Wis.	2
Iola, Kan.	3	Rochester, Minn.	1
Idaho Falls, Idaho	3	Richardson, N. D.	1
Joplin, Mo.	3	Round-up, Mont.	2
Janesville, Wis.	1	Red Lodge, Mont.	2
Jersey City, N. J.	8	Rupert, Idaho	1
Judith Gap	1	Ripon, Wis.	1
Judson, Alberta	1	Rawlins, Wyo.	3
Jamestown, N. D.	1	Rock Sp'ngs, Wyo.	4
Kimbball, S. D.	1	Rock Lake, N. D.	1
Kansas City, Mo.	148	Rexburg, Idaho	1
Kellogg, Idaho	1	Shokane, Wash.	191
Kerobert	1	Shreveport, La.	5
Kearney, Neb.	4	Sheridan, Wyo.	5
Kinmano, N. D.	1	San Francisco, Cal.	56
Klamath Falls, Or.	2	Saskatoon, Sask.	6
Leonard, N. D.	1	Sumner, Wash.	15
Lexington, Ky.	1	Seattle, Wash.	152
Lairne	1	St. Paul, Minn.	67
Liverpool, England	1	St. Louis, Mo.	34
Laurel, Mont.	9	Shelby, Mont.	8
Lincoln, Neb.	18	Sioux Falls, S. D.	20
Lewiston, Mont.	7	Sidney, Mont.	1
Laramie, Wyo.	6	Springfield, Ill.	6
La Crosse, Wis.	5	San Diego, Cal.	4
Laramore, N. D.	1	Sioux City, Iowa	35
Lamar, Colo.	1	Salina, Kan.	5
Louisville, Ky.	6	St. Joseph, Mo.	8
Lethbridge, Alta.	4	Springfield, Mass.	11
Lake Benton, Minn.	1	Salt Lake, Utah	18
Los Angeles, Cal.	66	Stanley, N. D.	1
Livingstone, Mont.	1	Stanford, Mont.	2
Lewistown, Mont.	3	Stillwater, Minn.	3
Lonnon	1	Sheridan, Wyo.	1
Lincoln, Neb.	3	Swift Current, Sask.	1
Leadville, Colo.	1	Superior, Wis.	2
Langdon, N. D.	1	San Waco, Tex.	1
Las Animas, Colo.	1	St. Johns, N. D.	1
Lubhuck, Tex.	2	Susnenson Bridge, N. Y.	17
La Grande, Oregon	1	San Antonio, Tex.	2
Lexington, Tenn.	2	Silver Lake, Minn.	1
Little Rock, Ark.	1	San Angelo, Tex.	1
Minneapolis, Minn.	374	Spiritwood, N. D.	2
Mott, N. D.	3	San Diego, Cal.	3
Minot, N. D.	77	Shreveport, La.	1
Miles City, Mont.	5	Sacramento, Cal.	2
Mooscow, Sask.	11	Shawnee, Okla.	1
Montreal, Quebec	4	San Pedro	2
Mox, N. D.	3	Silva, N. D.	1
Missoula, Mont.	20	Sykeston, N. D.	1
Mitchell, S. D.	6	Sioux Falls, N. D.	1
Mesa, Ariz.	1	Shoshone, Idaho	1
Milwaukee, Wis.	31	Toneka, Kan.	3
Milner, N. D.	2	Thorn, N. D.	1
Moscow, Idaho	9	Tulsa, Okla.	31
Montpelier, N. D.	6	Thief River Falls, Okla.	2
Maple Creek, Wn.	1	Towner, N. D.	4
Mandan, N. D.	2	Toledo, Ohio	3
Muskogee, Okla.	5	Tacoma, Wash.	37
Malta, Mont.	1	Texarkana, Tex.	1
Marshalltown, Ia.	2	Tucson, Ariz.	1
Moorehead, Minn.	1	Toronto, Ont.	6
Mineral Point, Wis.	1	Taylor, Tex.	1
Mankato, Minn.	2	Trinidad, Colo.	1
Minn. Trans. Minn.	2		
Mason City, Iowa	2		
Medicine Hat, Alb.	2		



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China Lillies

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Postpaid.

Grow in pots or glasses—they are sure to bloom.



Temple, Tex.	1	Wallace, Idaho ...	3
Tulca, Neb.	1	Worster, Mass.	4
Tripp, S. D.	1	Wenatchee, Wash.	1
Twin Falls, Idaho	4	Webster, N. D.	2
Underwood, N. D.	2	Waterloo, Iowa	1
Valley City, N. D.	11	Weiser, Idaho	1
Victoria, B. C.	3	Wichita, Kan.	5
Vancouver, B. C.	12	Wendell, Idaho	1
Van Hook, N. D.	1	Warden, Mont.	1
Virgen, Mont.	1	Ward, Minn.	1
Walton, N. D.	1	Washburn, N. D.	1
White Fish, Mont.	51	Wheatland, N. D.	1
Williston, N. D.	25	Wilkie, Sask.	1
Washington, D. C.	14	Watertown, S. D.	2
Winnipeg, Man.	19	White Sulphur	
Weyburn, Sask.	11	Springs, Wyo.	1
Waco, Tex.	13	Yorktown, Sask.	1
Wahpeton, N. D.	1	Zealand, N. D.	1

Apple Distribution in the United States

[Editor's Note—The following is a sample report mailed daily from the Office of Markets of the Department of Agriculture, Spokane, in connection with the Fruit Growers' Agency. Every grower should read this to fully appreciate the reliable information that is being furnished daily by the Office of Markets, in co-operation with the Fruit Growers' Agency.]

UNITED STATES DEPARTMENT OF AGRICULTURE.

OFFICE OF MARKETS.

Spokane, Washington, October 26, 1916.

Northwestern apples reported shipped yesterday:

Burt, N. Y.	3	Moosjaw, Sask.	1
Boston, Mass.	6	Milwaukee, Wis.	1
Baltimore, Md.	4	Minot, N. D.	2
Bismarck, N. D.	2	New York, N. Y.	7
Butte, Mont.	1	Nampa, Idaho	1
Cincinnati, Ohio	2	Norton, Kan.	1
Council Bluffs, Ia.	1	New Orleans, La.	1
Claxeston,	1	Ommaha, Neb.	9
Chicago, Ill.	21	Onaga,	1
Cheyenne, Wyo.	1	Ogden, Utah	1
Crete,	1	Olympia, Wash.	5
Carrington, N. D.	1	Oklahoma City, Ok.	2
Crawford, Neb.	1	Pocatello, Idaho	1
Cutbank, Mont.	1	Payette, Idaho	1
Denver, Colo.	13	Proctor,	1
Duluth, Minn.	7	Philadelphia, Pa.	6
Dalhart, Tex.	1	Providence, R. I.	1
Dubuque, Iowa	1	Ritzville, Wash.	1
El Paso, Tex.	1	Seattle, Wash.	4
Edmonton, Alberta.	1	Spokane, Wash.	8
Fort Worth, Tex.	1	Sioux Falls, S. D.	2
Fairview, Okla.	1	St. Paul, Minn.	3
Fulton, S. D.	1	Sioux City, Iowa	2
Gilman, Mont.	1	St. Louis, Mo.	1
Glenwood, Minn.	1	Swiftcurrent, Sask.	1
Great Falls, Mont.	1	San Diego, Cal.	1
Geneva,	1	San Francisco, Cal.	2
Glennallen, N. D.	1	Suspension Bridge, N. Y.	1
Grand Island, Neb.	1	Winnipeg, Man.	1
Grand Forks, N. D.	1	Williston, N. D.	4
Houston, Tex.	1	Weyburn, Sask.	1
Hysham, Mont.	1	Wheatland, N. D.	1
Hope, N. D.	1	White Sulphur	
Indianapolis, Ind.	1	Springs, Wyo.	1
Jersey City, N. J.	1	Webster, N. D.	1
Kansas City, Mo.	4	Watertown, Minn.	1
Los Angeles, Cal.	4	Washington, D. C.	3
Laramie, Wyo.	1	Whitefish, Mont.	3
Lethbridge, Alberta.	1	Underwood,	1
Lewistown, Mont.	1	Virgen, Mont.	1
Laurel, Mont.	1	Valley City, N. D.	1
Minneapolis, Minn.	19		
Montpelier, Idaho.	3		
Medicine Hat, Alta.	1	Total cars.	197

Not previously reported: 22d, 1 Minneapolis, 1 New York, 1 New Orleans. 23rd, 2 Boston, 2 Baltimore, 1 Boise, 1 Fresno, 4 Los Angeles, 5 New York, 1 Suspension Bridge, 1 San Francisco. 24th, 1 Aberdeen, 1 Detroit, 1 El Reno, Okla., 1 Los Angeles, 1 Pittsburgh, 1 Rock Springs, Wyo., 1 Salt Lake City. 25th, 1 La Grande, Oregon, 1 Salt Lake City. Total 29 cars.

Total shipments to date this season, 5,814 cars. Total shipments same date last season, 48 cars. Total shipments for season same date last year, 5,852 cars.

Diversions reported yesterday: From Minot—1 Brandon, N. D., 1 Grand Forks, 1 Cando, 1 Minneapolis to Grand Forks, 1 Chicago to Fargo, 1 Grand Forks to Larimore, N. D. From Whitefish—1 Cedar Rapids, 1 Chicago, 1 Baltimore, 1 Houston, 1 Minneapolis to New York, 1 Denver to Omaha, 1 Chicago to Milwaukee, 1 Kansas City to New Orleans, 1 Hastings, Neb., to Aberdeen, 1 Laurel to Minneapolis, 1 Freeport, Ill., to Chicago. Shipped Oct. 5—1 Topeka to Manchester, N. H.; Oct. 11—1 Cheyenne to Kansas City; Oct. 12—1 Kansas City to Fort Smith; Oct. 13—1 Omaha to Kansas City; Oct. 14—1 Omaha to Fort Worth, 1 Kansas City to Indianapolis; Oct. 18—1 Cheyenne to Chicago; Oct. 19—1 New York to Boston; Oct. 20—1 Denver to Trinidad, 1 Spokane to Minot; Oct. 21—1 Philadelphia to New York, 1 Omaha to Grand Island.

Apple shipments from other sections: Maine 21, Vermont 10, New York 142, New Jersey 27, Pennsylvania 2, Peninsula 3, Potomac Valley 183, Maryland 2, Virginia 37, Ohio 1, Michigan 38, incomplete, Illinois 16, Iowa 1, Missouri 16, Arkansas 33, Nebraska 6, Kansas 8, Colorado

32, California unreported, Northwest 197. Total reported for the United States 765 cars, of which approximately 26% were shipped from the Pacific Northwest.

Not previously reported: Tuesday—Ohio 3; Michigan, 3 rail, 25 boat; Missouri 8, Nebraska 1.

TELEGRAPHIC REPORTS TODAY—JOBING PRICES.
Atlanta. Cold, clear. Receipts light. Quality, condition and demand good. Barrels, Virginia, No. 1 Grimes \$5; No. 1 Winesaps \$4, 2s \$3.50.

Boston. Cool, clear. Receipts 10 cars Western, 3 Eastern, and approximately 500 packages by freight. Market fair, demand moderate. Barrels, Maine and Massachusetts, No. 1 Baldwins \$2@2.50. Boxes, street sales, Jonathans XF \$2@2.50, Fancy \$1.75@2; Spitzenburgs and Delicious XF \$2.50@2.75; Wagener's Fancy \$1.50. Auctioned yesterday, 4 Washington XF Jonathans, average \$1.90, fancy \$1.65; XF Wagener's \$1.35@1.80, average \$1.53, Fancy \$1.15@1.50, average \$1.31; XF Grimes \$1.40@2.15, average \$1.80, Fancy \$1.20@1.75, average \$1.31. Stock so far of good quality.

Birmingham. No boxed apples quoted.
Cleveland. Cool, cloudy. Four cars arrived. Market active. Barrels, No. 1 Baldwins \$3.40@3.75.

Cincinnati. Cool. Nine cars arrived, 14 unloaded, 11 held over. Unreported yesterday, 8 cars stored. Market firm, demand moderate. Barrels, Virginia, Grimes, car lots \$4.50; New England, Baldwins, generally good quality and condition, \$3@3.25. Boxes, XF Spitzenburgs \$2.25, Fancy \$2; XF Delicious \$2.50@2.75, Fancy \$2.25@2.50.

Chicago. Cold, cloudy. Receipts 59 cars, 73 held over. Unreported yesterday, 20 cars arrived, 3,500 barrels by boat. Market steady, demand good. Barrels, Illinois and Missouri, Jonathans \$4@5.50, best \$5.50@6; Grimes \$3.50@4.50; New York and Michigan, Baldwins \$2.50@2.75. Boxes, XF Jonathans \$1.75@2, Fancy \$1.50@1.75; XF Grimes \$1.75@2. Auctioned yesterday, Washington, XF Jonathans, average \$1.84.

Charleston. No boxed apples quoted.
Columbus. No boxed apples quoted.
Detroit. Cloudy. Four cars arrived. Market active. Quality and condition good. Barrels, Baldwins \$3.25@3.75.

Denver. Cool, clear. Twelve cars arrived, 10 unloaded; 5 cars diverted, 5 held over. Market steady, demand good. Boxes, Jonathans (few Washington) XF \$1.85, Fancy \$1.60, Choice \$1.35; Grimes XF \$1.95, Fancy \$1.70; XF Rome \$1.95, Fancy \$1.80.

Des Moines. Cold. One car Washington arrived. Demand moderate. Barrels, hold-overs, Jonathans and Grimes \$4.50@5. Boxes, Washington, Grimes \$1.75@2.25.

Dallas. Cool, clear. Receipts heavy. Quality and condition good. Boxes, carlot prices, Colorado, XF Jonathans \$1.65; Washington, Jonathans and Grimes XF \$1.60, Fancy \$1.50.

Fort Worth. Cold, clear. Thirty cars arrived. Demand good. Boxes, carlots, Washington and Colorado, XF Jonathans \$1.75, Fancy \$1.50@1.60; XF Grimes \$1.65, Fancy \$1.50.

Houston. Cool, clear. Supply adequate. Quality and demand good. Boxes, Washington and Colorado, Jonathans and King Davids, XF \$2@2.10, Fancy \$1.75@1.85.

Indianapolis. Cool, clear. Seven cars arrived. Demand good. Barrels, Jonathans \$5@6; Grimes \$4.50@5.50; 2s selling \$1 less.

Jacksonville. Cool, cloudy. Receipts liberal, demand good. Barrels, Virginia, Winesaps, Fancy \$4@4.50, Choice \$3.75@4.25.

Kansas City. Cool, clear. Five cars and approximately 700 bushels home grown unloaded, 12 cars held over. Market firm, demand moderate. Barrels, Jonathans, 1s, good condition, \$1.75@5, mostly \$5, 2s \$3.75@4.50. Boxes, Washington, Jonathans, XF \$1.75@2, mostly \$1.85, Fancy \$1.50@1.75, jumble pack, Fancy \$1.65@1.75; Winter Bananas, Fancy, mostly \$2; Delicious, XF \$2.50@2.65, mostly \$2.65, Fancy \$2.25@2.50; Grimes, Fancy \$1.75@1.85. Colorado, Jonathans, 1s \$1.50@1.75.

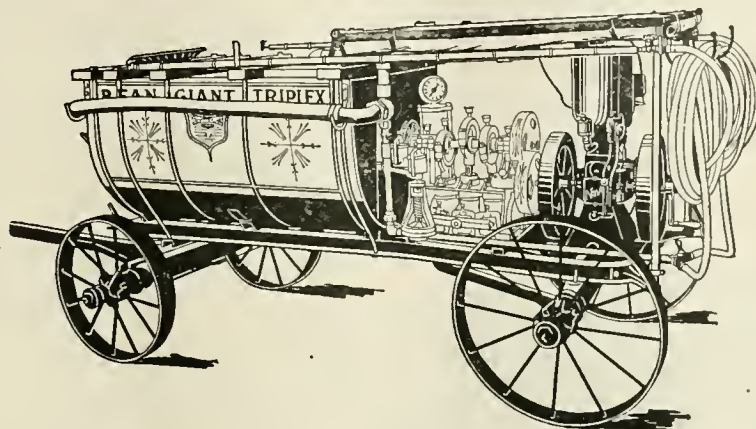
Milwaukee. Clear. Four cars arrived. Demand good. Barrels, Fancy Jonathans \$4.50@5.50, Choice \$3@4; Baldwins \$3@3.75. Boxes, Jonathans, XF \$1.75@2.25, Fancy \$1.50@1.75.

Memphis. Cool, clear. Receipts falling off. Condition good. Virginia, Winesaps \$5@5.25 per barrel.

Minneapolis. Cold, cloudy. Eleven cars arrived, approximately 87 held over. Market steady, demand good for good stock. Condition good. Prices small way. Barrels, Jonathans, good color 1s, \$5.50@6; Baldwins \$4.50@4.75. Boxes, Washington, Jonathans, XF \$2@2.25, mostly \$2@2.10, Fancy \$1.75@2; Spitzenburgs, XF \$2.25; Greenings \$1.60; Delicious O.R. \$1.75.

New Orleans. Cool, clear. Receipts heavy, demand good. Barrels, Virginia, Winesaps \$5.10. Boxes, Washington, Winter Bananas \$2.60, Delicious \$2.45, Spitzenburgs \$2.40, Jonathans \$2.15; Colorado, Jonathans \$1.90.

Nashville. No boxed apples quoted.
New York. Cool. Unloaded, 68 Eastern, 14 Western. Market steady, demand good. Quality and condition good. Barrels, New York, Baldwins, A \$2.75@3.25, B \$1.75@2.50. Boxes, Washington, Gravensteins \$1.35@1.60, Kings



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Include it in the first part of your tour



\$1.25@1.75; XF Jonathans \$1.75@2.25; Winter Bananas \$1.75@2.50; Grimes \$1.75@2; Romes \$1.50@2.50; Delicious \$2.50@3.00, small size \$1.65; Spitzenburgs \$2.25@2.75. Oregon, Winter Bananas, XF \$1.50@2.50, Fancy \$1.65@2.25; Kings \$1.25@1.75. Auctioned yesterday, 1 car Idaho. Demand good. Market slightly higher. Jonathans average \$1.62, Winesaps \$1.50, Grimes \$1.26.

Omaha. Four cars arrived. Market active. Quality and condition good. Barrels, Nebraska, Missouri and Iowa, Jonathans and Grimes \$1.50@5; Winesaps \$3.75. Boxes, Jonathans and Grimes, Washingtons, \$1.50@2.

Oklahoma City. No boxed apples quoted.
Philadelphia. Cool, clear. Arrived 19 cars, 20 unloaded, 9 on track. Market strong, demand good. Quality and condition good. Barrels, Jonathans, poor quality, \$1.50; 1 car Jonathans auctioned, XF averaging \$1.91, Fancy \$1.81 per box.

Pittsburgh. Cool, clear. Arrived 12 cars, 63 held over. Market firm, demand good for good stock. Barrels, New York, Baldwins, A grade, fair quality, \$3. Boxes, Washington, Jonathans XF, small way, \$2@2.50; Winter Bananas, XF \$2.10@3.25, Fancy \$2.50@2.75.

St. Louis. Cold. Arrived 10 cars, 10 unloaded, incomplete; 11 cars on track, incomplete. Unreported yesterday, 1,100 bbls. by boat. Levee sales yesterday, barrels, Winesaps \$3.65@4, 2s \$2@2.50; Washington, Jonathans, XF \$1.90@2, Fancy \$1.75, small way.

St. Paul. Cold, cloudy. Receipts 5 cars, 18 held over. Market draggy. Barrels, Jonathans, XF \$5.50@6, 1s \$5@5.50. Boxes, Missouri, Winesaps, mostly \$1.65; Washington, Jonathans, XF mostly \$2, Fancy \$1.75.

San Antonio. Cool, clear. Receipts moderate. Quality good. Boxes, carlot prices, Jonathans, XF \$1.65, Fancy \$1.40, Choice \$1.35; Winesaps, XF \$1.75, Fancy \$1.55; Ganos, XF \$1.55, Fancy \$1.40; Bens, XF \$1.45, Fancy \$1.30.

Washington. Cool, clear. Arrived 5 cars, 7 unloaded. Market slow. Virginia and West Virginia, Grimes \$1.75@5, mostly \$1.75; Winesaps \$3.50@4. Boxes, Washington, Jonathans and Grimes, XF and Fancy, \$2.00.

Only Jonathans, Grimes, Winesaps and Baldwins are covered in quotations on barreled varieties.
E. E. BAKER.
C. W. KITCHEN.

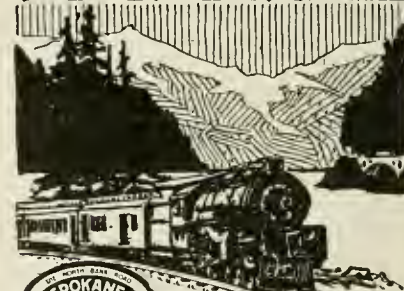
Prunes Bring Good Price.

T. G. King, of Miller and Red Apple Road, has sold his prune crop amounting to fourteen cars to the Walla Walla Fruit Company, of Walla Walla, at 80 cents the box for all packing out six by six and better. He has already started shipping in car lots. He, together with Dr. A. H. Saunders, own the only large orchards of prunes in the valley.—Wenatchee World.

Inspector Must Inspect.

Horticultural Inspector De Sellem has served notice on shippers that in order for his deputies to give shipments of apples an inspection certificate the apples must be actually inspected and that the practice of some shippers of loading a car, bracing it and then calling an inspector just before locking the door, expecting the inspector to take a look inside and issue a certificate that the apples therein are of the quality and pack represented, must cease. Mr. De Sellem also again reminds shippers that his office must have twenty-four hours' notice that inspection is desired, as his deputies are very busy and one is not always immediately available.—Yakima Republic.

WATER LEVEL GRADE THRU THE CASCADES



SPokane
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Seattle
NORTH BANK ROAD

EASTWARD
Through the Spokane
Country
OR
California

Two Fine Trains
DAILY

Portland to Chicago
in 72 hours

Portland to San Francisco via North Bank Road and S.S. Northern Pacific. Fast schedule. Finest accommodations. Low fares.

S.S. Great Northern

Special Cruises to the Paradise of the Pacific—Honolulu.

R. H. CROZIER, A. G. P. A.
PORTLAND, OREGON

Spokane Apple Show, Nov. 20-25

Some Field Notes on Making Ditches with Explosives

There seems to be great differences in the response of different soils to the action of explosives. In going over the figures and the record pictures of a dozen or more ditches that had been blasted out, in Maryland, Pennsylvania, Michigan, Louisiana, Mississippi and other states, it was plain that no one rule could be laid down for all cases. Economical ditch blasting can be done only when the ground is wet. Yet if it is too wet experience has shown that a successful ditch cannot be made. For instance, in muck swamps in Maryland and Louisiana, where the material was semi-fluid, the explosives threw out enough material to leave a ditch, but the banks immediately moved in and closed up the cavity. Fortunately these conditions do not prevail at all over a large part of the country. Such ground is almost unknown in the North. Sandy soil offers another problem. When there is just enough water to bind the sand and what little loam and clay may be mixed with it, and not enough to make the sand soft, ditches can be blasted out very effectively and satisfactorily. You should see that the charges are placed shallow enough so that they do not tend to send their gases to useless depths in the softer subsoil. Do not try to blast ditches in dry sand, or, for that matter, in dry ground of any kind, though if you cannot wait for the wet season and are willing to meet an increased expense, you can blast ditches through dry clay or heavy loam. The most economical and satisfactory soils in which to blast ditches are the lighter clays or heavy loams, such as prevail in parts of Michigan, Western Maryland, Pennsylvania and in many other states. Here, whenever the ground is watersoaked, or even fairly moist, the results of blasting are surprisingly good. One reason probably is that the substrata of earth nearly always are solid and gas-resisting.—J. R. Mattern.

FRUIT GROWERS AND ASSOCIATIONS:

Please keep us in mind regarding the marketing of your APPLES and other fruits. If you haven't already arranged for selling your crop we would appreciate your writing to us at once stating fully what you have.

Our Mr. W. C. Michaels is now stationed at Wenatchee, Wash.

Crutchfield, Woolfolk & Clore

11 West So. Water St.

CHICAGO, ILLINOIS



He won't touch it

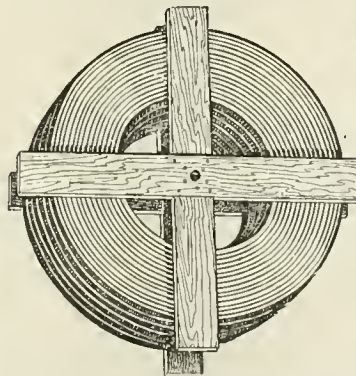
This fellow will leave your harness strictly alone if it's soiled with Eureka Harness Oil—no animal oils in Eureka, and he hates it.

EUREKA Harness Oil

Keeps new harness young — makes old harness like new. It pays to use it. Ask your dealer today.

Standard Oil Company
(California)

Spend a Nickle and Save a Dime



Use Peerless Duplex Strapping

ON YOUR
Shipping Boxes
and

No. 3 Peerless Duplex Strapping in coils of 6,500 feet each—\$14.63 per coil with liberal discount.

- (1) You will prevent pilfering.
- (2) You will prevent damage in handling.

No. 3 Duplex Strapping is made of high grade Cold Rolled Steel of considerable tensile strength and pliability. The turned edge protects the packer's hands; the knurled center prevents the nail from slipping while being driven.

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TWISTED WIRE AND STEEL CO.

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We will have some Big Specials to offer Fur Shippers throughout the coming Fur Season. It will pay you to get your name on our mailing list at once.

Your success depends on the Fur House you ship to. Start Right. Ship your first lot to us. Our returns will convince you.

Write today for our free book, "Fur Facts," Price List, Tags and prices on Traps, Baits, Supplies.

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RED CROSS
FARM
POWDER

*The Original and Largest Selling
Farm Explosive*

Why use expensive high speed dynamites when this slower, safer farm powder will save you from \$3 to \$5 per hundred pounds and for most farm uses do better work?

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World's largest makers of farm explosives.

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And pay highest prices for **Fine Fox, Mink, Martens, Rat, Lynx, Wolves and all other Furs, Hides and Ginseng.** Best facilities in America. Send for Free Price List and Shipping Tags. No commission charged.

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Bank

HOOD RIVER, OREGON

A. D. MOE - - President
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Capital and Surplus \$125,000
Assets Over \$500,000

Member Federal Reserve System

Activities of the Fruit Growers'
Agency, Incorporated

The Fruit Growers' Agency, Incorporated, is already proving itself of great value to the grower through its activities along many lines, although it has only been organized since last March. The principal activities of this office at the present time may be summarized as follows: Daily "Market News Service" based on telegraphic reports over a direct wire from Washington, D. C. This service is conducted by Mr. C. W. Kitchen, Market Station Assistant, assisted by Mr. H. A. Harris, also of the Office of Markets. Special service pertaining to "Uniform Account Sales" and "Accounting Methods," conducted by Mr. G. A. Nahstoll, assistant in Market Business Practice, of the Office of Markets. An assistant will be assigned to Mr. Nahstoll in the near future to enable him to make more frequent visits to the various districts. Special investigation of packing houses and storage facilities, conducted by Mr. C. T. More. Mr. More is now in Washington to consult with his chief regarding this work, after having made a preliminary survey of the situation in the Northwest. "Rendering of Crop Estimates Secured in Conjunction with State Authorities." It has been unable to secure any definite crop reports from either Oregon, Idaho or Montana, but a complete estimate of the tonnage for the State of Washington was furnished us July 9, and a revised estimate is now being prepared. The Office keeps in close touch with the above named officials of the Office of Markets and state officials, and renders such assistance as may be needed. Frequent conferences are held between these officials and the officials of the Agency to secure the best possible results.

The Agency has also taken up a number of matters relating to transportation questions. It is evident that more can be accomplished along these lines by a body composed of a number of organizations representing 80 per cent of the entire tonnage of the Northwest than by any one organization. The following are some of the subjects referred to: (1) Diversion privileges to Canadian points; (2) Adjustment of diversion charges; (3) Storage in transit privileges into certain Eastern points; (4) Precooling and original icing by shippers; (5) Transportation rates on ocean freight; (6) Report of railroad at destination; (7) Adjustment of rates into territory east of the Mississippi and south of the Ohio River; (8) Adjustment of rates on Oroville branch. In addition there are numerous other matters that are looked after by the Agency, which will be reported from time to time.

A Cross-Continent Record.

In the first round-trip ocean-to-ocean run to be made by any automobile against time, the Hudson Super-Six which reached San Francisco Sunday morning, September 24, 1916, in both the going and return trips broke the best previous one-way records. The

Pull Big Stumps
by hand

Showing
easy lever
operation

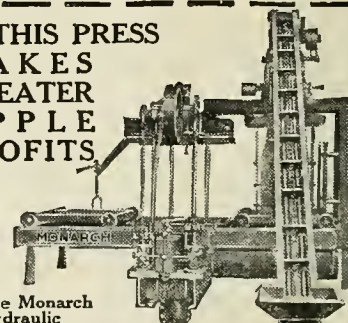
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Puller**

Write today for special
offer and free booklet on
Land Clearing.

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GREATER
APPLE
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The Monarch
Hydraulic
Cider Press

Is suitable for both individual and merchant service. With it you can work up all the culls into profitable cider. Our celebrated high pressure design, combined with minute accuracy in construction, produces maximum quantity of juice from the apples with low operating expense.

Monarch Presses are built in sizes having capacities from 15 to 400 barrels a day. 60-page Press Catalogue explaining the numerous exclusive Monarch features sent free on request. Write for this instructive book to-day.

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We also manufacture Engines, Saw Mills, Thrashers, Potato Diggers, Grain Drills, Cultivators.

PREPAREDNESS
FOR YOUR HOME

is important too. A good Airedale means preparedness against two and four legged animals—and the best pal ever. Get that child a LADDIX BRED Airedale and feel SAFE.

LADDIX KENNELS
ESTACADA, OREGON

round trip from San Francisco to New York was made in 10 days 21 hours 3 minutes. Last spring the best one-way record from coast to coast was 7 days 8 hours. The Super-Six used was a seven-passenger touring car and carried at all times three and sometimes four passengers. Previous one-way records were established with roadster and stripped models. On the return trip the car was 1½ hours ahead of its going schedule up to within 250 miles of the finish. On account of heavy rains in crossing the Sierra Nevada Mountains 15 hours more time was required to cover that leg than was taken in the going trip. The average speed going and coming, including all stops and slowing down to speed requirements of more than 350 cities, towns and villages passed through each way, was close to 700 miles a day. Three drivers, Ralph Mulford, A. H. Patterson and Charles Vincent, by making train jumps, piloted the car on its round trip across the continent.

Minneapolis Cold Storage Co.

Latest and Modern Construction with Automatic Sprinkler Protection Throughout.

Located on Gt. Nor. and C. B. & Q. Tracks
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Storage-in-Transit Privilege with
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Insist on C. & S.

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RAT CURE
TABLETS
ONLY RATS WILL EAT
TRY BEFORE YOU PAY
KILLS 4 RATS FOR 1 CENT
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PRUNE AND WALNUT TREES FOR SALE

We offer fine stocky prune trees and Vrooman strain grafted walnut trees at bed-rock prices. Also a full line of other nursery stock at bargain rates. Write today.

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YOU CAN EARN **\$50.00** PER DAY
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Gearless Improved Standard
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Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2½ gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.
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ZEROLENE
the Standard Oil for Motor Cars

From Western Crude—

Western, Asphalt-base, crude makes the highest grade motor oil, not only in our opinion, but also in the opinion of unprejudiced experts and of increasing thousands of satisfied users.

Sold by dealers everywhere and at all Service Stations of the Standard Oil Company (California)



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in 1859

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Regardless of the size of his or her account will find the officers of this bank always ready to give earnest attention and thought to any business matters on which advice may be desired. Please do not hesitate to avail yourself of the progressive, helpful service of this pioneer bank.

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**Walnuts, Pears, Cherries, Apples,
Prunes, Loganberries**

Fruit prices are high. Get in line for future prosperity.

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First National Bank Building, ALBANY, OREGON

THE GOOD JUDGE SETTLES A MISUNDERSTANDING.

I'LL POKE ANY MAN IN THE JAW THAT SAYS W-B CUT IS NOT THE REAL TOBACCO CHEW.

COME OFF-- RIGHT-CUT IS THE REAL TOBACCO CHEW, SO POKE YOUR OWN JAW.

WAIT, BOYS YOU'RE BOTH RIGHT W-B CUT IS LONG SHRED, RIGHT-CUT IS SHORT SHRED, BUT BOTH ARE THE REAL TOBACCO CHEW NOW SHAKE HANDS.



YOU want to remember that the same fine stock is used in both W-B CUT and Right-Cut. The difference is that one is long shred and the other is short shred, both seasoned with a bit of salt. You will know *real tobacco satisfaction* when you cut out the old kind and take up either one of the Real Tobacco Chew twins. *A little chew lasts and satisfies.*

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Covers a City Block.

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European Plan—\$1.00 per day and upward

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GEO. C. OBER, Manager

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THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
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7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly

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Arcadia Orchards Company

Deer Park, Washington

Apple Facts

Are you getting your share of good apples?

Supplies are abundant and prices reasonable.

Reliable authorities say the apple is one of the most wholesome of our fruits and has medicinal virtues of the greatest value.

The phosphorus contained in apples renews the nervous matter of the brain worker and restores the nervous energy necessary for the next day's work.

It starts all the secretions into vigorous action and floods the system with a new tide of life.

It is a friend of health and a foe of disease.

It is food, tonic, condiment and cosmetic all in one.

It plants roses in the cheeks.

It is the oldest of our known food necessities.

There are 197 different ways to prepare apples.

Ask your grocer or market man for apples.

"Health's best way, eat apples every day."

Good Gasoline Easily Obtainable.

A certain prominent automobile manufacturer stated, in a recent newspaper article, that his new motor was especially designed to handle low grade gasoline, or "poor gasoline," as he put it. "High test gasoline," he said, "is not easily obtainable in the most favored localities." Commenting on this article, C. H. Hamilton, district sales manager of the Standard Oil Company, said yesterday: "Evidently the Pacific Coast was overlooked by this manufacturer in making up his list of 'most favored localities.' Otherwise his statement regarding the scarcity of good gasoline wouldn't hold good. For Pacific Coast motorists, at least, should have no difficulty whatsoever in obtaining pure, high test distilled gasoline. Our company has been for years, and now is, putting out only this real good old-fashioned all-refinery unmixed gas, and our distributing machinery has put this gasoline into practically every town and hamlet on the Pacific Coast. There's no need for the Pacific Coast motorist to go without good gasoline."—Adv.

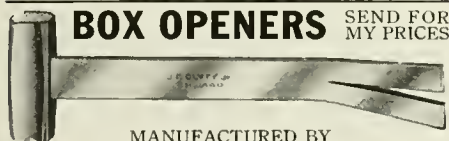
Middle aged men who are not able to do hard manual work, but who must earn a livelihood, can make good money selling home orders of our Fruits, Flowers, Roses, Shrubs and Ornamental Trees. Farmers and Fruit Growers are getting the highest level of prices for their products in twenty-five years, and are going to improve their homes. Our best men are selling from \$500 to \$700 per week—average men from \$100 to \$500. **OUR NEW AGENTS CONTRACT IS A WINNER.** Write at once for territory. **PACIFIC NURSERY COMPANY, 122½ Grand Avenue, Portland, Oregon.**

Propagating Roses by Fall Cuttings.

Climbing roses are propagated mostly by hardwood cuttings made in the fall; many cut-flower roses may be propagated in the same way. Hardwood cuttings are taken from the dormant wood of winter, while softwood or greenwood cuttings are taken when the plants are in active growth. To make a hardwood cutting, good, strong, well ripened shoots of the past summer's growth should be selected. These are better if cut between the time the leaves fall and freezing weather. If left until after cold weather there is danger of injury from freezing. They should be cut into pieces of five or six inches, with the upper cut just above a bud, and should be tied in bundles with raffia or with string that does not rot easily if exposed to dampness. After labeling plainly they should be buried in moist sand, tops down, and placed in a cool cellar or buried in the open ground below danger of frost. They should be planted in the open ground in the spring about or a little before corn-planting time, so that one or two eyes, or not over one inch of the cutting is above ground, which will leave four or five inches in the ground. Care must be taken not to injure the calluses that have formed while the cuttings were buried. Sometimes better results are obtained by planting in partial shade. Frequently cuttings made in winter or early spring do nearly as well as those made in the fall, but in the North there is always danger of the wood being injured during the winter.—Office of Information, United States Department of Agriculture.

Fairs, Land and Apple Shows

Ninth National Apple Show, Spokane, Washington, November 20-25.
Northwest Livestock Show, Lewiston, Idaho, November 26 to December 2.
Cascade International Stock Show, North Yakima, Washington, November 27 to December 2.
International Livestock Exposition, Chicago, Illinois, December 2-9.
Pacific International Livestock Exposition, North Portland, Oregon, December 4-9.
National Western Stock Show, Denver, Colorado, January 20-27.



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Indoor Closet

**More Comfortable,
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Eliminates the outdoor privy, open vault and cesspool, which are breeding places for germs. Have a warm, sanitary, odorless toilet right in your house. No going out in cold weather. A boon to invalids. Endorsed by State Boards of Health.

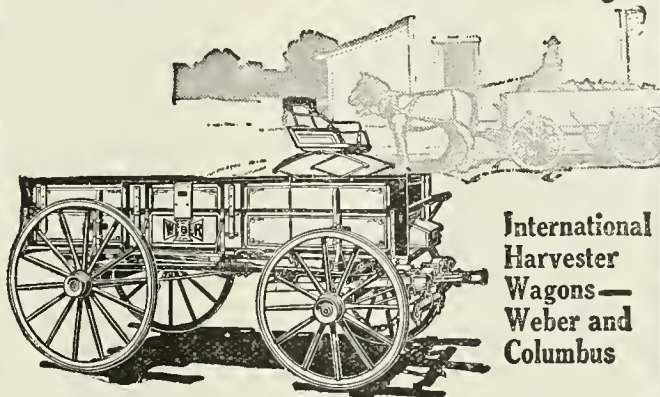
ABSOLUTELY ODORLESS

Put It Anywhere In The House

The germs are killed by a chemical process in water in the container, which you empty once a month. Absolutely no odor. No more trouble to empty than ashes. Closet absolutely guaranteed. Write for full description and price.

ROWE SANITARY MFG CO. 1123A ROWE BLDG., DETROIT, MICH.
Ask about the Ro-San Washstand—Hot and Cold Running Water Without Plumbing

More for Your Money



**International
Harvester
Wagons—
Weber and
Columbus**



YOU can be sure of one thing when you buy a **Weber or Columbus wagon**—You get more service for your money. The good service they give is one of the strongest features of **Weber and Columbus** wagons. This service is the result of careful design and construction, such as is shown in the **International fifth wheel**.

Look between the front axle and bolster, where the king bolt goes through. There you will find the fifth wheel (an exclusive feature). Note the wide circular wearing surface of the two substantial fifth wheel plates. Those plates relieve the owner of a lot of trouble. They prevent breaking or bending of circle irons. They prevent the pitching of the bolster that breaks or bends king bolts. They take strain off the reach and keep the lower part of the front axle from sagging.

This one feature adds years to the life of the wagon, but, better even than that, it indicates the care and thought that have been given to every **Columbus and Weber** feature, and they are many.

Look over the **Weber or Columbus** wagon carefully, either at the local dealer's place or in the illustrated wagon folders we will send you on request. Then you will see why, if you want more for your money, your next wagon should be a **Weber or Columbus**.

International Harvester Company of America (INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
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"BLUE RIBBON"

*Grimes Golden and Jonathan
Apples*

*Winter Nellis and Burre D'Anjou
Pears*

In straight or mixed cars.

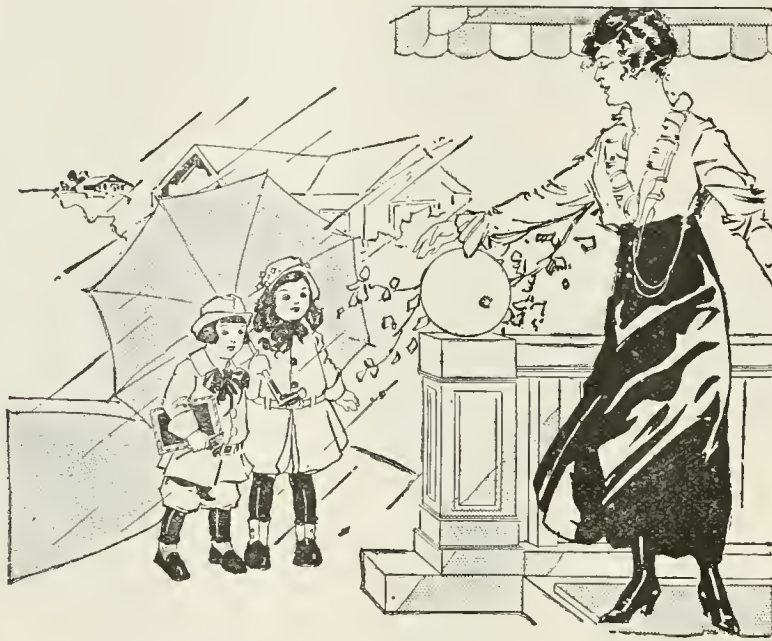
All orders given careful and prompt attention.

Wire for Prices.

Yakima County Horticultural Union

FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON



"Hurry, children—I've got a real treat for you."

Ghirardelli's Ground Chocolate

*is a fortifying food beverage for
all—from childhood to old age.*

It comes **PROTECTED**—as all chocolate
should—in $\frac{1}{2}$ -lb., 1-lb., and 3-lb. hermet-
ically sealed cans.



Since 1852

D. GHIRARDELLI CO.

San Francisco



ED. H. WITTE

My Big Factory Output Makes WITTE Prices Low

*If I can only
make a clear
profit on an
engine, I can
buy a good
farm each
year. What
more could I
ask?*
Ed. H. Witte.

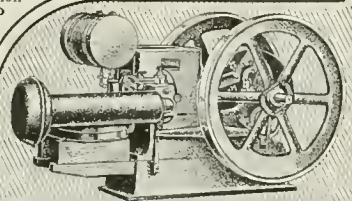
SO far as actual engine value is concerned, I would
be justified in charging double the present prices for
WITTE Engines. Great factory efficiency and selling direct
from factory to user makes these prices possible.

I would rather manufacture 10,000 engines a year at a profit of
one dollar each, than only 1000 engines at \$10 each, or 100 at \$100 profit
each. Every engine I sell helps sell others.

It has been proven that **quantity** production makes production cost
low. I could not build WITTE engines so good if I built only **hundreds**
while I build **thousands**. A man, for example, who turns fly wheels all
day can do a quicker job and better job than if he worked at it only a
half hour each day and then ran a truck or swept the floor and worked on
pistons the rest of the time. In the big WITTE factory, a man becomes an
expert in making his particular part of the engine. My actual cost for high
quality engine parts is from $\frac{1}{2}$ to $\frac{3}{4}$ what many others pay. My own private gas
well to furnish power helps hold cost down.

WITTE Engines require only one-tenth of one gallon
of fuel per horse-power per hour; develop from 30 to
50 percent surplus power over rating. Made in 2,
3, 4, 6, 8, 12, 16 and 22 H.P., sizes in different styles, as
ordered to operate on Kerosene, Gasoline, Naphtha,
Distillate or Gas, also in stationary, hand portable,
portable and saw-rig. **90-Days' Trial; 5-Year
Guarantee.** Cash or Terms. Write today for big
free book, "How to Judge Engines."—Ed. H. Witte.

WITTE ENGINE WORKS,
1882 Oakland Ave., Kansas City, Mo.
1882 Empire Bldg., Pittsburgh, Pa.



**GET
THIS
BIG BOOK
FREE**



The Fruit Growers' Agency, Inc.

The Federal Office of Markets is in-
vestigating the problem of central pack-
ing houses and the standardization of
fruit grading. W. M. Scott, specialist in
fruit grading and standardization, to-
gether with C. T. More, specialist of the
investigation of grades and standards,
both of the Office of Markets, have just
completed an extensive trip throughout
the Northwest with a view to familiar-
izing themselves with Northwestern
conditions. Mr. More has returned to
the East, where he was called by the
Department, while Mr. Scott will re-
main in the Northwest throughout the
coming apple season completing his
investigations. The problem of central
packing houses is an important one for
the apple industry. If some efficient
and satisfactory plan can be evolved
whereby all the fruit in a particular
section can be sorted and packed at one
house, the problem of packing will not
only be simplified, but greater efficiency
and standardization will be possible.
The central packing house is already
being tried by some of the districts of
the Northwest. This problem is only
one of many which is being studied as
the result of the activities of The Fruit
Growers' Agency.

Clean Up Your Garden.

If the weeds have flourished in your
garden, or in parts of it, mow them
down, now. If they have not gone to
seed they can be plowed under later to
help out the stable manure you apply,
but if they have they should be removed
from the garden and thrown on the
compost heap; composting kills weed
seed.

Weeds are expensive things to have
in gardens, or anywhere else; they rob
garden crops of food and moisture;
many of them are natural food for all
kinds of insects, which when they have
devoured the choice parts of weeds at-
tack adjacent garden crops. Weeds may
also support plant diseases that would

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otherwise die, and they induce mildews and rusts by reducing air and sunlight around the garden plants. These weeds are now going to seed; winter winds will jar that seed out, and the chances for a heavy stand of weeds next spring will be quite good.

Other good things to remove now, and as the later crops mature, are the crop remnants, especially if there has been disease or insect infestation. Dead stalks are wintering-over places for diseases and insects.

Stalks removed had best be burned, though if a compost pile is made the insect-infested stalks may be thrown on it. Disease spores survive the composting temperature; burning is safest.—J. S. Gardner, Missouri College of Agriculture.

Notes on the Gas-Action of Farm Explosives.

Of late years there has come on the market, in response to a growing demand from farmers, explosives particularly suited to their work. The coal miner has his particular kind and grade of dynamite and powder, and the rock and quarry man his kinds. Too often the mine and rock powders and dynamites have been sold for farm purposes, and the result has been that the stump blasting, or subsoiling, or ditching, has not been done as it should have been, either in cost or effectiveness.

For removing stumps, and more particularly for soil tillage with explosives, a certain comparatively slow, lifting, heaving and cracking gas action is wanted. This is totally different from the quick, sharp, shattering and cutting action of most mine and quarry explosives. The proper farm powder will produce an entirely different condition in the soil than will an explosive which is best to use for breaking up stone. The blasting of earth, particularly dry earth, and the removing of roots from the earth, is an entirely different proposition from the blasting of stone. In fact, the stone explosive cannot be used with satisfaction in soil work. You cannot get the effect desired.

Another thing that should be more generally known is that the right kind of farm powder will cost you less than the stone or mine explosive. It is made with an ammonia base instead of a nitroglycerine base, and in these days of war nitroglycerine is a mighty expensive commodity. The average 40%

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dynamite is both expensive and inefficient for farm work, compared to the right kind of farm powder. The farm powder is somewhat safer than the dynamite, too, because it requires more of a shock to explode it.

Apple picking is made easier if the weeds are mowed in the orchard and the place kept clean. Pickers are disgruntled and do poor work where they have to wade through weeds and briars wet with dew or autumn rains.

OFFICE OF
THE FRUIT GROWERS AGENCY, INC.
Walla Walla, Washington.

September 12, 1916.

For the purpose of giving the growers and selling agents of the Northwest better news service on fruit movements, branch offices have been opened by The Fruit Growers Agency in the Federal Building in Spokane. The Agency thus has the advantage of a central location, with the best telegraphic and mail service. The news service as given on summer fruits will be continued on apple shipments, and additional services will be added.

Several representatives of the Office of Markets from Washington are now working in the Northwest for the efficiency of this department. W. A. Sherman, specialist in market service survey, together with his assistant, O. W. Schleussner, are collecting data and making arrangements for a more extensive news service. C. E. Bassett, well known as chairman of the committee which helped to organize The Fruit Growers Agency, is also working in the Northwest.

Due largely to the activity of the Agency, the railroads have granted diversion privileges for fruit shipments from the Northwest to Canadian points. The Agency is also making particular efforts with the object of securing storage in transit privileges for apples and pre-cooling and initial icing privileges.

The Agency is giving special service to its members by way of weekly bulletins containing telegraphic reports on Canadian markets. These reports are received directly from the Department of Agriculture at Ottawa and are compiled by them. They show the market prices on different fruits in the principal Canadian markets and are of great value to growers and shippers sending fruit to Canadian points.

Corvallis, Oregon, Sept. 26, 1916.

Editor Better Fruit:

Yours of the 23rd received. I was exceedingly glad to learn that the crop in Hood River is going to be so large. With you, I realize that the growers are becoming encouraged and their confidence is being restored. The fruit growers of the State of Oregon and of the entire Northwest have an opportunity this year to feel mighty good. Crops have been large and of splendid quality, and prices are fine. The pear men have never received better prices than they have this year. Many prunes are contracted at seven cents. Loganberries are now being contracted for three to five years on a three-cent base. There are more orders for raspberries, blackberries, etc., than the growers can fill. Buyers are here trying to contract for the crop of nuts, such as walnuts, filberts, and apple prices are going good. Surely it looks as though the depression which came upon Western horticulture is being released and we are entering a new era of prosperity.

We should, however, be on our guard. Whenever we are exceedingly prosperous it is very difficult to organize and to come down to a realization of what the real problems are. The next year or two this prosperity means greater and harder work for the leaders of horticulture to try to put on the finishing touches of organization and co-operation, which are so essential to a permanent success in our Pacific Northwest. There always have been periods of depression; that is true of all phases of agriculture, and it can be expected to be true in the future. However, much could be done to relieve the pressure in future years, and to take steps to prevent the re-occurrence of some of the things we have experienced in the past ten years. From present indications there is going to be quite a large development in Oregon during the coming year, especially along such lines as walnuts and filberts, prunes and berries.

With kind regards, I remain, sincerely yours,
C. I. LEWIS.

Chief, Division of Horticulture,
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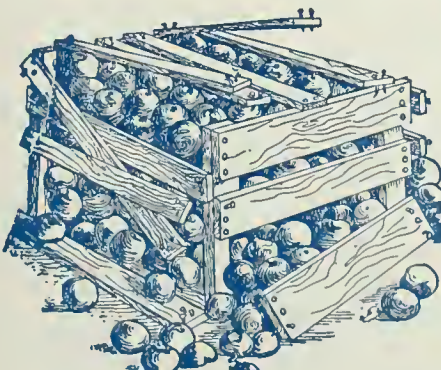
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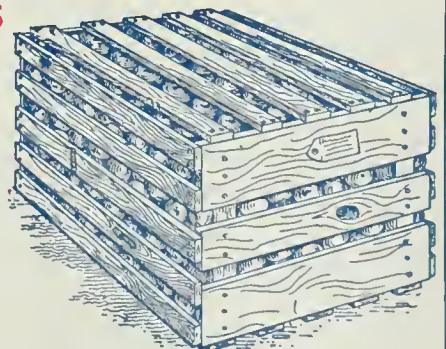
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VOLUME XI

DECEMBER, 1916

NUMBER 6



THE DELICIOUS APPLE.

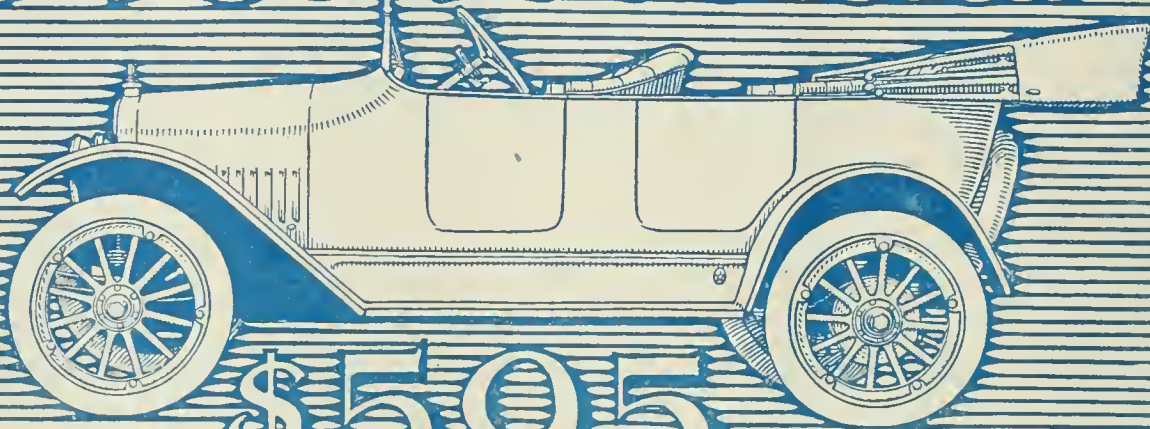
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"As industrial engineer for the Consolidated Gas Company of New Jersey, I must have a car that will give me service throughout the entire year, winter as well as summer. My operation is hard on a car, as I drive it every month of the year, through storm as well as clear weather, and through muddy as well as smooth, dry roads. My mileage per gallon is necessarily low proportionally because I have a great many calls to make which of course necessitates many starts and stops, which tend to make poor efficiency records; this is also accompanied by considerable idling of the engine. However, for four months of operation I have averaged twenty-three miles to one gallon of gasoline, which is

considerably higher than I was able to obtain with my other car.

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"In my opinion the 1916 Maxwell Car is by far the best buy and greatest value for the money of any make of automobile made in the United States this year, when the matter is carefully considered from every standpoint. I remain, "Yours very truly,

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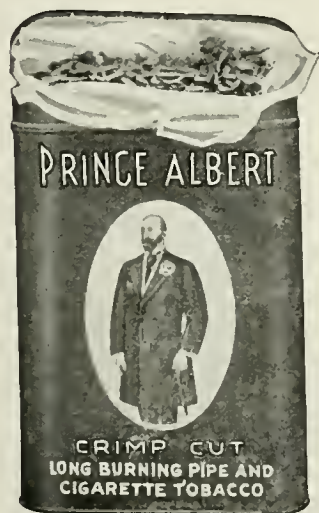


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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Consideration of the "Bulk" Pruning Question

By V. R. Gardner, Professor of Pomology, Oregon Agricultural College, Corvallis

ANYONE who has had occasion to make a somewhat careful survey of literature pertaining to pruning fruit trees realizes the improbability, if not almost the impossibility, of advancing an entirely new idea on the subject. It has been discussed so often that something has been said on almost every phase of the question. Furthermore, the literature on pruning shows that there is hardly any practice followed, or any theory held, about which there are not opposite views. It may almost be said that the literature of pruning is very largely a record of opinions formed, of views held, rather than a record of facts ascertained and principles established. What is needed in a difficult field like that of pruning is, first, the collection of a large body of facts—facts that are presented just as they are found, uncolored by any opinions or theories regarding their explanation. Once in possession of such a large body of facts, it should be possible carefully to analyze and interpret them. Perhaps it is too much to expect that we may learn all that they have to teach, but certainly there should be a few lessons that we can draw from them. Fortunately we are not entirely without data regarding certain pruning operations. The difficulty has been that in too many cases the amount available has been too small to warrant the conclusions that have been reached. Sometimes, too, a large amount of evidence has led to erroneous conclusions because considered from unfortunate points of view, or because closely related facts have not been taken into consideration. Viewpoint is often as important to a correct interpretation of evidence as is the accumulation of additional data that bear on the question.

It is not the intention in this article to present a large body of new data. Time is not available for a detailed presentation of all the evidence, nor is it necessary in this instance. The illustrations cited are simply representative of examples that without doubt the reader has seen duplicated in many orchards in many parts of the country. In other words, the full body of facts here called in evidence includes the observations and experiences of many fruit growers and investigators. The object of the article is rather to suggest a point of view for a consideration of this evidence. It is not claimed that it is a new point of view, but it is one that without doubt is given too little consideration by those directing, or engaged in, pruning our orchard trees.

Pruning Considered As an Operation Affecting the Tree As a Whole.

In pruning practice and in the consideration of pruning problems, outside of those dealing with the healing of wounds, most people look upon pruning as something directly affecting the tree as a whole. We speak of pruning this tree heavily and that one lightly; of heading back one and thinning out another; of winter pruning in one instance and summer pruning in another. We say that a certain tree that has been neglected for a number of years requires a heavy pruning to bring it back to a vigorous productive condition. Such a statement is made regardless of the fact that while possibly certain parts of the tree should be pruned heavily, certain other parts should be pruned lightly, if at all. Taking it for granted that heavy pruning is synonymous with large cuts and much brush left on the ground, we proceed to do rather heroic work. If a tree thus pruned fails to attain quickly the vigorous productive condition we have in mind as an ideal, we wonder why the result has not been satisfactory, especially when general opinion seemed to be that heavy pruning was required. On the other hand, when it is decided that another tree requires only a light pruning, we proceed to take out only a very few branches, and consider it fortunate that so little work is required. If such a pruning is attended by some of the results usually accompanying a heavy pruning again we wonder why. These statements, which will be recognized as based upon very general experience, serve to illustrate the fact that pruning is looked upon as a kind of bulk problem—as something which is decided upon for the tree as a whole, done to the tree as a whole, and to which the tree as a whole responds. It is some of the negative evidence on this question with which this article is mainly concerned.

Evidence From the Results Following "Dehorning."

Everyone who has had much experience in pruning fruit trees, and many who have been simply casual observers, have seen trees that have been more or less severely cut back or "dehorned," as it is called when the cutting back has been very heavy. In fact, this is the kind of pruning with which some people are best acquainted. The type of growth that almost invariably follows such pruning is well known. If the dehorning has been done in winter or early spring, numerous comparatively upright shoots will be produced during the following summer. The usual prac-

tice is to thin out these shoots and head back those that are left, the idea being to develop as quickly as possible new fruiting branches. Thus is the tree reinvigorated—"rejuvenated." So well is this procedure understood that we regard as practically settled the questions as to when and how to rejuvenate our trees. We assume that the tree as a whole responds to the treatment given, and there the matter rests. But does the tree as a whole respond? And is the whole matter to be thus summarily dismissed? Even a cursory examination of a tree that has been recently dehorned shows that only a part of the tree has responded. Because it happens to be the part upon which we have, through habit, come to focus our attention makes it none the less a part, and not the whole tree. Undisturbed branches in the lower part of the dehorned tree usually continue to grow in the ordinary way. As a rule their spurs bear flowers and fruit no more regularly and yield a product of no better grade than before. Their older spurs and smaller fruiting branches are nearly as prone as ever to become gradually weaker and die. Apparently neither as whole branches nor in their separate parts have these branches in the lower part of the tree been accelerated or retarded in growth. The chances are that they have not even produced watersprouts, such as have developed so abundantly on the dehorned branches above them. In other words, there is an important portion of the tree, often its most important portion, that has apparently not been affected by the dehorning, either for better or for worse. Though the tree as a whole has been pruned heavily, a large part of the tree has not felt the influence of the pruning. Dehorning has not rejuvenated the whole tree; it has resulted merely in the production of new wood to replace a portion of the old top.

Evidence From Results Following Partial "Dehorning."

Even more striking evidence on this question of the distance to which the influence of pruning extends is furnished by trees that have been partially dehorned, i.e., have had a portion of their branches cut back very severely and other branches of equal size and that reached to an equal height left untouched. In such instances what we have come to regard as the characteristic results of dehorning usually are limited almost entirely to the branches that have been cut back. These branches give rise to watersprouts in abundance, but the unpruned branch continues to grow and function as though nothing

had been done to upset the normal course of events in the tree. The case presented is that of a single branch, or several branches, immediately surrounded by the effects of a particular type of pruning and yet neither having received a stimulus from the pruning itself or an influence from the new vegetative growth resulting from it. So far as results are concerned, they may be compared with those following the occurrence of a frost in some region. Because of elevation or location, killing temperatures are not reached and vegetation is not injured in a particular orchard, though neighboring orchards possessing the same kind of soil, containing the same varieties, swept by the same prevailing winds and falling within the same general storm areas may have their new growth entirely destroyed. Another particular orchard receives no benefit from a rain coming at a critical time, if just before reaching the orchard the path of the storm is turned in another direction by a momentary shift in the air currents. Similarly a particular limb is apparently little benefited or injured by the pruning shears or saw that greatly injures or benefits, or even entirely removes, the surrounding or neighboring limbs. All have seen examples of the point that is made here in old trees of one species or another that were being top-worked, where the top-working was being distributed over a period of several years. The heavy pruning that such trees receive, incident to the top-working process, usually is not reflected to any appreciable extent in a changed manner of growth on the part of the ungrafted limbs. On the contrary, the influence of the heavy pruning is apparently mainly limited to an area close to the point of insertion of the scions. This seems to be true not only for the first season, but for as long as the tree remains in a partially top-worked condition.

Evidence From the Type of Pruning That Entirely Removes a Few Large Limbs.

If there is a type of pruning that lies at the opposite extreme from the cutting back to stubs of a number of large limbs for purposes of grafting and at the same time leaving one or more large limbs uninjured to help temporarily to maintain a balance between top and root, it probably consists in the entire removal of one or more comparatively large limbs, the majority of the limbs being left unpruned. This may be considered a kind of bulk thinning. In a way it is the converse of the bulk heading back practiced in dehorning. Few will fail to recognize it as a type of pruning commonly employed by many fruit growers. It at least possesses the advantage of requiring little labor. At first thought one might imagine that if bulk heading back influences only certain parts of the tree and not the tree as a whole, certainly bulk thinning out should operate in an opposite manner. However, let us see whether or not it does. When a single large limb is removed from almost any part of a tree, watersprouts develop to take its place, and the rest of the tree top continues to

grow much as though no pruning had been given. Attention is again called to the point of origin of these watersprouts. They spring, in the main, not from limbs far removed from the pruning wound, but close to where the cut was made. There is an unmistakable response to the bulk thinning, but that response is evident within a very limited area. The tree as a whole does not show it.

Those who have intentionally or unintentionally permitted a leader to develop for a number of years and form close-centered trees and have then tried to train them as open-centered or vase-shaped trees can furnish abundant evidence on the question under discussion. The removal of the central leader from trees of this kind (bulk heading back or bulk thinning out, depending upon the form of the tree and where the cut is made), is almost always followed by the production of a number of watersprouts that attempt to take the place of the removed leader. The subsequent removal of these watersprouts is followed by the production of still other watersprouts, nearly always springing from points near the wound left by the removal of the leader. On the other hand, the unpruned branches of the tree seem to be little influenced by the cutting out of the leader.

What has just been said regarding the bulk pruning of old trees apparently holds true for younger trees, though perhaps to not quite the same degree. When trees that have not yet reached bearing age, or that are just coming into bearing, have one of their larger limbs entirely removed in order to train them to a desired shape, new shoots usually start to take the places of the limbs that have been cut out. Those who have had any considerable experience in attempting to develop open-centered Yellow Newtown apples or Bartlett or Anjou pears, or close-centered McIntosh apples or Winter Nelis pears, know how difficult it is to keep shoots and limbs from growing up in the center in the first instance, and from spreading out and even growing down in the second, by simply cutting them out or off; and, what is of equal or greater importance, make the other shoots and limbs of these same trees spread out or grow upright, as the case may be, and thus profit by the food materials that it is desired to divert from the closely pruned parts. In fact, so persistent are the watersprouts in attempting to replace removed limbs that many careful growers are coming to realize that the easiest way to develop an open-centered tree is not to cut out all of the growth in the center, but rather to simply suppress it by pruning it a little more severely than the surrounding branches that are desired to form the main framework of the tree. Even then it is to be doubted if the normal growth of the remaining branches is materially changed. Similarly, when young trees are lightly, or even heavily, headed back, new shoots are sent out, but mainly from points where some of them can easily replace the portion removed. It is not usual for

distant portions of the tree to show a clear cut response to the pruning.

It may be argued that when the thinning out and heading back that are usually afforded very young trees is practiced, the tree as a whole responds to the treatment—sometimes nearly every bud starting to vegetate. Without doubt such trees are influenced as a whole by the pruning given them, but it must be remembered that every part of such trees is pruned; and that probably the tree is influenced as a whole only because each part is separately and distinctly influenced.

Evidence From Spur Pruning.

Also bearing on this same question are the results that are obtained from what might be termed "spur pruning." As they become older, some varieties of apple and pear trees are very prone to develop large numbers of fruit spurs, spurs that often branch and rebranch until they become fruit spur clusters rather than individual spurs. If more or less neglected, such trees finally reach the state where they make hardly any new shoot growth, practically their entire energies being absorbed by their fruit spur systems. Usually when there are such large numbers of fruit spurs but a comparatively small percentage can flower and fruit in any single season, and the record of any single spur, or even spur cluster, especially in the older parts of the tree, would show very irregular fruiting. Such trees present a condition in which, though there is little of what we commonly speak of as vegetative growth, nearly all of the energies of the tree are really being absorbed in a slow vegetative growth of the spurs. The engineer would say that the fruiting machine is so large and complicated that nearly all the power is required to overcome friction; consequently but a small portion of a full load can be carried. The economist would say that it is an instance of the trees using up most of their income in their own overhead charges. Such of course is recognized as the condition that many seek to remedy by dehorning or by some other type of bulk pruning. That bulk pruning is only a partial remedy has already been pointed out. Some have seen the experiment tried of removing a part of the spurs from such trees—a half, or two-thirds, or even three-fourths of them. As the spurs possess a very large percentage of the normal growing points and bear practically all the leaf system of a tree in such a condition, it will readily be seen that such a thinning of spurs is really the equivalent of a heavy pruning, except perhaps in the total weight of wood tissue removed. Treated in this way, trees do not produce watersprouts, as they do when dehorning or the removal of a few large branches takes away an equivalent number of growing points. In fact, they produce very few watersprouts. However, the remaining spurs show a much more vigorous growth and the new shoot growth that develops from normal lateral and terminal buds is much longer and more vigorous. The net result is that the tree is changed

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Maintaining Soil Fertility Largely A Local Problem

A. G. Craig, Before the Washington State Horticultural Association, Wenatchee, Washington, December 9, 1914

THE experiment stations of the states of the United States and of Europe have devoted more attention to the subject of fertilizers and soil fertility than any other subject in the annals of agriculture. Farmers and fruit growers have also expended vast sums of money experimenting with commercial fertilizers. The results of the experiments have been somewhat contradictory and the literature on the subject is more or less confusing. This is proof that the subject of maintaining soil fertility is more or less of a local problem.

We often hear it said that Washington soils are well-nigh inexhaustible, and indeed it is true that they are rich in many of the elements of fertility. But we now know from experience that the continuous cropping of wheat in the Willamette Valley in Oregon has reduced the yield of wheat from sixty bushels per acre to as low as ten bushels per acre. This is true to a smaller degree in our own fertile wheat belt. The following is copied from Bulletin No. 121, Pennsylvania State College Agricultural Experiment Station:

"There is an important need for fertility in any orchard that is actively producing and growing. The actual extent of this need can be approximated chemically by determining the average composition of apple wood, leaves and fruit, and by applying these figures to what may be considered good annual amounts of these products. This we have done both for apples and for a 25-bushel crop of wheat, with results shown in Table I. The annual weights for apples are based on a yearly production of 100 pounds each of wood and leaves, and of fourteen bushels of apples per mature tree. All these amounts are distinctly less than those actually observed and reported, but inasmuch as they give an annual yield of 490 bushels per acre of thirty-five trees they are considered sufficient for the present purpose.

"In the first place it will be noted that in total food draft the apples exceed the 25-bushel wheat crop in every constituent except phosphoric acid, and in that they fall behind by only half a pound. Notwithstanding this fact, the trees are usually able to maintain themselves much better and longer than wheat. This is probably largely because of their much longer season of root activity, their more natural demands, the annual return of most of the plant food in their leaves, and their ability to curtail production for one or more seasons when conditions become unfavorable. Without going into details, however, it is quite evident that very important amounts of plant food are annually removed by an apple orchard. Scarcely any soil can furnish all these materials indefinitely in the amounts and at the times required, and unless proper assistance is rendered there must come a time when production is materially reduced and off seasons occur.

"Returning to the table, it is of interest to note the relatively large amounts of nitrogen, potash and lime, and the comparatively small amount of iron annually taken up by the apples. Nearly all the lime remains in the wood and leaves, while a large proportion of the potash finds its way to the fruit.

"This large amount of lime seems to have some significance, so far as the wood is concerned, because, as shown later in several of our experiments, its application has resulted in considerable improvement in growth. In the fruit, however, very little lime is required, and hence its application should not be expected to affect the yields materially, and this corresponds with our field results. Moreover, the total effect of adding lime alone is surprisingly small, in comparison with the large amounts that are taken up. Either these amounts are merely drawn in and deposited mechanically by the transpiration stream, and hence are largely without physiological significance, or else the average soil is still able to supply the needed lime.

"In view of the large amount of potash carried by the fruit, one might suppose that its addition to the soil would be very important in improving yields, and this idea has been widely proclaimed, especially by those considering only the chemical composition of the fruit. As indicated later, however, it seems that most orchard soils are already sufficiently supplied with potash in available forms and that the chief shortages occur in the nitrogen and phosphates. This is the case notwithstanding the fact that the latter mate-

rials are actually required in considerable smaller amounts.

"From these facts it is evident that there is comparatively little relation between response and total requirements in the case of plant food and that something more than a knowledge of the chemical composition of the fruit and wood is needed before one can properly fertilize an orchard. Even with the additional knowledge of the composition of the soil, the problem is not much simplified, because it is impossible as yet to duplicate sufficiently the conditions existing in any soil. A chemist may determine the total amounts of plant food present, but he cannot yet determine their actual availability to the trees with sufficient accuracy to be of much value.

"The practical and proper fertilization of an orchard, therefore, becomes an experimental problem, and its solution is dependent primarily upon the pomologist or horticulturist, supplemented by local tests. In other words, the question is not so much what amounts of plant food are annually taken up, nor what amounts are present, but rather it is what responses are made when certain kinds and quantities of plant food are actually added to an orchard soil."

Results From the Johnson Orchard Experiment.

"In this experiment fertilizers were applied per acre as follows: Actual nitrogen, 50 pounds; actual phosphoric

TABLE I.—THE RELATIVE PLANT-FOOD DRAFT OF WHEAT AND APPLES.
(In pounds per acre annually, based on American and German averages.)

	Wheat Grain Lbs.	Wheat Total Lbs.	Apple Wood Lbs.	Apple Leaves Lbs.	Apple Fruit Lbs.	Apple Total Lbs.
Annual weights	1,500	4,200	3,500	3,500	21,500	31,500
Nitrogen (N)	30.0	43.7	11.3	25.6	16.2	53.1
Phosphoric acid (P ₂ O ₅)	10.0	15.8	3.6	5.3	6.1	15.3
Potash (K ₂ O)	9.8	26.8	6.6	15.9	41.5	64.0
Lime (CaO)	0.81	8.0	29.1	29.5	3.0	61.6
Magnesia (MgO)	3.0	6.1	4.1	8.9	3.1	16.7
Iron (FeO) .....	...	...	0.5	1.5	0.8	2.8

TABLE II.—INFLUENCE OF FERTILIZATION ON YIELDS (JOHNSON ORCHARD).
(Yields in pounds per plat and bushels per acre annually, 1908-1912.)

	1	2	3	4	5	6	7	8	9	10
	Check	Nitrogen and Phos.	Nitrogen and Potash	Check	Phos. and Potash	Comp. and Ferti- lizer	Check	Ma- nure	Lime	Check
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1908	90	528	237	416	57½	759	211	278	558	106
1909	675	6,018	5,257	1,932	3,089	6,621	2,008	3,531	1,216	1,266
1910	2,575	3,265	1,822	3,168	3,552	2,108	1,629	6,149	3,185	3,505
1911	283	7,563	7,816	617	1,227	8,209	1,362	4,874	388	196
1912	1,021	1,225	696	1,382	1,385	189	1,226	6,698	741	474
Totals 4 years....	4,557	18,071	15,591	7,099	9,253	17,127	6,225	21,252	5,530	5,351
Average yield per acre (bushels)....	136.7	542.1	467.7	213.0	277.6	513.8	186.7	637.5	165.9	160.5
Gain over av. check .....	...	377.9	293.5	...	103.4	339.6	...	463.3	-8.3	...

TABLE III.

	—Pounds—			—Market Value—			
Produce	Nitrogen	Potash	Phos.	Nitrogen	Potash	Phos.	Total
Wheat, 25 bushels	36	7	6	\$ 7.20	\$0.35	\$0.75	\$ 8.30
Wheat straw, 1 ton.....	10	11	2	2.00	.85	.25	3.10
Velch hay, 3 tons.....	120	125	14	24.00	6.25	1.68	31.93
Alfalfa hay, 6 tons.....	300	150	25	60.00	9.00	3.00	72.00
Timothy, 2 tons	48	18	6	9.60	2.75	.75	13.10
Potatoes, 200 bushels	40	60	7	8.00	3.69	.85	12.45
Apples, 300 bushels	90	82	11	18.00	4.90	1.35	24.25
Fat cattle, 1,000 pounds.....	25	1	7	5.00	.05	.85	5.90
Milk, 10,000 pounds	57	12	7	11.10	.75	.85	13.00
Butter, 500 pounds	1	0.1	0.2	.20	.01	.02	.23
Fresh kale, 30 tons.....	240	190	50	48.00	9.50	6.00	63.50



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acid (P_2O_5), 100 pounds; potash (K_2O), 150 pounds; lime, 1,000 pounds; manure, 12 tons.

"In Table II is given the yields obtained from some of the above applications during the past five years. These results were obtained from an experiment with Baldwins, now twenty-four years of age, located on a volusia silt loam in Lawrence County, north of Pittsburgh. On first inspection these trees did not seem to be suffering especially from a lack of plant food, but they had not been bearing satisfactorily and their annual twig growth was averaging only about an inch, with occasional maximum growths of five or six inches. These rates of growth are continuing on the checks or unfertilized plats, but they have been practically tripled on the plats receiving proper fertilization.

"In estimating the influence of the treatments, the yields of the first year

are excluded, because they can never be materially affected by the application of the first season. The yields, as shown in Table II, are given in pounds per plat, and also in bushels per acre, annually for the last four years.

"In the first place it will be noted that the average yields of the checks or unfertilized plats have run fairly uniform, producing an average annual yield of 174.2 bushels per acre during the last four years. Lime alone (at the rate of 1,000 pounds per acre annually) has shown no improvement over the average check, but as a matter of fact it has averaged 8.3 bushels per acre less, a deficit that is doubtless largely or wholly due to incidental causes and natural fluctuations. The phosphate and potash combination has affected the yield here rather distinctly. This may be due at least partly to a possible advantage in location, as indicated by the fact that its adjacent check is the

highest producer among them and is averaging within 64 bushels of the phosphate-potash treatment. The growth on the latter plat, however, is nearly 3 per cent less than that of the normal unfertilized plat, and its general appearance is not appreciably superior to that of the checks. It is evident, therefore, that these trees are still vitally in need of something, although it will be noted that they are receiving the fertilization commonly advised for orchards, largely on the basis of chemical analyses.

"This need is being quite thoroughly met on the adjacent plat 6, which differs from number 5 only in the addition of nitrogen. The mere addition of nitrogen in this case has more than tripled the gain. Wherever nitrogen appears in the treatments very large yields are observed, and foliage and growth of the trees are also very satisfactory, the average gains in trunk girth ranging from 25 to 90 per cent.

"Plat 2, receiving nitrogen and phosphate only, at the present time shows a better gain than number 6, which receives potash in addition. This is directly connected with the almost complete crop failure that occurred in the latter plat this past season, and it is also doubtless partly attributable again to the natural fluctuations in yield. It shows, however, that no additional potash is needed in this orchard, so far as the yields are concerned.

"Phosphates are next in importance to nitrogen here, as indicated by the 42-bushel deficit that occurs on plat 3, as compared with number 6, when phosphorus is omitted in the former, and also by the high yields in plat 2. Manure, as a result of the extra large crop of 1912, when most of the other plats were having an off season, is now in the lead in this experiment, with the tremendous average yield of 637 bushels per acre annually for the past four years. This gives an annual gain over the check of 463 bushels per acre, which is a very satisfactory exchange for 12 tons of manure. This benefit from manure is doubtless largely due to its nitrogen content."

Fertility in Farm Produce.

In Table III, taken in part from Dr. Hopkins (Bulletin No. 123, Illinois Experiment Station) is given a statement of the composition and market value of the different plant foods carried by some common crops. From 50 to 95 per cent of the fertilizing constituents of food is recovered in the manure, depending upon the kind of animal fed. You can readily figure what fertility you are retaining on the farm by feeding the products.

Experiments by the United States Department of Agriculture indicate that with animals kept in stalls or pens throughout the year and the manure carefully saved, the approximate value of the fertilizing constituents of the manure produced by each horse or mule annually is \$27, by each head of cattle \$19, by each hog \$12, by each sheep \$2. These estimates are based on the values

Continued on page 26

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The Physical Handling of Fruit—Packing Houses

By C. I. Lewis, Professor of Horticulture, Corvallis, Oregon

WE can divide packing houses into two classes, viz, those privately owned and those of the community plan. There are a number of types which one can consider in the class of privately owned houses. The first that I wish to call attention to is the tent. The tent is not used with the idea of a permanent house, but is of great value where one has young orchards coming into bearing, or where the financial conditions are such that it is impossible for a few years to build ample storage and packing facilities. For a small amount of money one can accomplish a great deal in a tent. Many growers in the Pacific Northwest for the past two years have used these very satisfactorily. To use a tent to the best advantage one should equip it with a sizing machine, in order that the fruit may be moved more rapidly. Mr. E. H. Shepard, a fruit grower of Hood River, gives a report of his experience in handling fruit in a tent. He was able to move nine carloads of fruit in thirty-four days in a tent which measured 30x40 feet. The top of the tent was made of 12-ounce duck, and the sides of 8-ounce. The tops and sides were sewed together in one piece, and the ends were made separately of 8-ounce duck. The cost of the tent itself was \$80, the lumber \$25, and labor \$20, making a total cost of \$125, which is a small sum of money to invest for the handling of 10,000 boxes of fruit. These tents will give service for a number of years, for when the season is over they can be taken down and stored in a dry place. Many growers are so situated that they prefer to build a regular packing house. There are many types of such; they may consist of mere sheds, or, on the other hand, they may contain cool storage, or even cold storage. By cool storage we mean that the fruit is kept cool by the use of cool air and proper ventilation, and by cold storage we mean ice or some form of mechanical refrigeration. A little further on I will

give some suggestions concerning the details of the construction of storage houses. There are some advantages in having a packing house on your own place. It is very convenient to the point where the fruit is grown. It has one serious disadvantage, however, and that is that it is generally too expensive. It takes from \$2,000 to \$8,000 to build an average house which will furnish you with storage facilities that are adequate to keep the fruit in good condition. Of course you can build a packing shed for less money, but if you want to have any facilities for keeping fruit without causing it to deteriorate rapidly, it will take considerable money. On the other hand, you can work with your neighbors and build a plant which will be more efficient than you can afford to build and not nearly as much money will have been expended for each individual. The money that you have saved could be put into a permanent cold storage plant. In other words, we believe that the direction of packing house facilities in the Northwest will be along the lines of the construction of community packing sheds, and as soon as the fruit is handled in such sheds it will be transferred rapidly to a cold storage plant. We believe that by such an organization it will be possible to finance plants which would otherwise be impossible. Of course there are localities where it will be advisable to build combination plants, namely, those which are part packing and part storage. The community house has many advantages: First, it allows economy in the initial outlay and in operation; and second, it allows better work, since you can keep the help during the entire season, and you can generally give it a little better supervision, and can handle more tonnage in a short time. There is a chance for a division of labor. The neighbors can get together and one decide to take charge of picking, another charge of packing, another charge of grading, another charge of hauling, another charge of certain clerical duties. One can look after the hiring of help, and so on. As a rule much better equipment is found in the community houses than is found in the average house owned by the individual grower. There are some disadvantages, such as a longer haul for some people. We have not as yet worked out the best unit of co-operation. We know there are some houses that are accommodating five to a dozen orchardists to very good advantage. On the other hand, this year there will be houses in the Northwest which will accommodate from forty to sixty growers. Just how many growers can be accommodated in one shed to the best advantage is an open question. In other words, which will be the better policy, to build half a dozen very large community houses or fifteen or twenty smaller community houses? Probably the conditions in the different localities will settle that point to a large degree. The question of location of the commu-

nity packing house is one which needs serious attention. In strictly orchard districts it is well to locate the house as nearly central as possible to the territory it will serve. In many other sections, however, it will be much better to locate the house along the lines of the railroad. Especially is this true if storage is to be added to the packing shed. There are many types of community houses. Some of them are mere packing sheds; others simply converted buildings, such as blacksmith shops, hop warehouses, and similar buildings. In some places they are planning to combine the warehouse storage for hay and grain with fruit-handling storage. Some combine packing with cool-air storage, and still others have packing, cool-air storage, and refrigeration. It is possible to start a community house with a very small amount of capital, or it is possible and sometimes advisable to put in considerable money and build a permanent building. I am going to give a few descriptions of the different types of houses, and a few suggestions concerning the adaptability of the same to the various localities of the Northwest.

The first house I want to call your attention to is known as the Pioneer Packing House, in the Oak Grove district at Hood River. Two years ago five young men of that locality formed a partnership. They did not have sufficient money to invest in a building, but used a large blacksmith shop in that locality. The building measured 20x80 feet, and was centrally located. Each man was equally interested in the partnership and had an equal voice in the management. One was selected as the foreman of the packing house, another was foreman of the picking crew, another had charge of the teaming between the orchard and the packing house, while another had charge of the accounts and attended to matters which needed attention in town. The apples for the members were handled at cost,

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and the profits for those hauled for other parties were divided equally among the members. They ran a common picking crew and were in a position to handle the fruit of each member from the tree to the warehouse. All labor was hired by the hour. They made a flat charge of 20 cents a box for sorting, sizing, packing, nailing, furnishing paper, etc., and delivering to the warehouse in Hood River. All apples were delivered to the house in packing boxes with the owner's name stamped on each box, and this seemed to obviate confusion. The equipment consisted of a Palmer sizer, two box presses and one truck. The members state that they would not for a moment consider going back to the old way of each man handling his own fruit. They claim they are able to hold the same

help from year to year, and are planning a little later on building a bunkhouse to handle the help. Instead of paying 5 cents a box for hauling, as they did formerly, they now do it for 2½ cents. They have also been able to do very good inspection of fruit at a minimum cost. They have demonstrated that they can pack their fruit together much cheaper than they can singly, and that they can afford to take care of some of their neighbors at a price which is attractive to them. The accompanying statement of the amount of work that has been done by the Pioneer Packing House in the past two years, as furnished by the secretary, Mr. George B. Gladden, will be of interest to those growers who are planning the formation of a similar plant.

PIONEER PACKING HOUSE—GENERAL SUMMARY FOR 1915

Grower's Number	200 and larger	Smaller than 200	Continued from October issue.			
			Extra	Fancy	Choice	Cookers
1	908	11	225	473	154	67
2	770	16	285	213	201	84
3	486	..	171	188	95	12
4	410	11	211	111	90	36
5	660	15	299	159	144	71
6	1,879	27	547	565	490	265
7	1,006	..	517	270	219	..
8	632	29	293	170	133	65
9	195	3	23	67	92	16
10	251	..	133	70	31	12
11	266	8	58	116	86	14
12	211	2	115	51	41	9
13	240	1	65	60	69	47
Totals	..	..	2,950	2,513	1,851	728
Percentages	..	..	36.7	31.3	23	9

COSTS:		1915	1914
Number of packed boxes.....		8,128	4,891
Supplies.....	\$0.039	\$0.035	
Packing.....		.035	.04
Hauling to town.....		.035	.035
Overhead and depreciation.....		.117	.012
Haul store to shop.....		.0017	..
All other labor.....		.0583	.054
Totals.....		\$0.176	\$0.176

ITEMS OF PROFIT:		
3,319 boxes packed for members at \$0.021 saving.....		\$ 79.65
Boxes packed for others.....		128.32
Picking crew.....		9.24
Teamster.....		8.01
Total.....		\$225.22

COSTS OF PICKING AND HAULING:			
Grower No. 5:			
Cost of picking.....	\$36.97	Packed box \$0.0562	Loose box \$0.0369
Cost of picking.....	9.41	.0137	.0092
Totals.....		\$0.0699	\$0.0161
Grower No. 11:			
Cost of hauling.....	\$6.40	\$0.0236	\$0.0146
Cost of additional one mile.....		.0099	.0054
Grower No. 8:			
Cost of hauling.....	\$11.35	\$0.017	\$0.0113
Cost of additional one-half mile.....		.0033	.0021

The only candied apple made in the United States is made from Western apples by a Western company. Process originated with Mrs. D. L. Pratt of Wenatchee, Washington. She was a judge of the Women's Department at the Spokane National Apple Show in 1914, where some home-made candied apples were entered for prizes. She returned home and worked out a process of her own, turning out a product that compared to advantage with any of the commercial candied fruits on the market. These she had as a surprise for her family Christmas reunion dinner. Her son, Randall S. Pratt, saw commercial possibilities in the product and perfected the process for commercial use at the chemical laboratory at the University of Washington. A company was formed, of which he is manager, and operates a factory at Hood River, Oregon, for this and other fruit products. Name, Fancy Fruit Products Co. Hundreds of boxes were sent east as Christmas souvenirs from the different apple districts last year and the factory was not able to fill all the orders. They have enlarged facilities this year and anticipate a still larger business. Are advertising in this issue to send Christmas boxes direct from factory to any point in the United States and enclose Christmas card.

Middle aged men who are not able to do hard manual work, but who must earn a livelihood, can make good money selling home orders of our Fruits, Flowers, Roses, Shrubs and Ornamental Trees. Farmers and Fruit Growers are getting the highest level of prices for their products in twenty-five years, and are going to improve their homes. Our best men are selling from \$500 to \$700 per week—average men from \$100 to \$500. OUR NEW AGENTS CONTRACT IS A WINNER. Write at once for territory. PACIFIC NURSERY COMPANY, 122½ Grand Avenue, Portland, Oregon.

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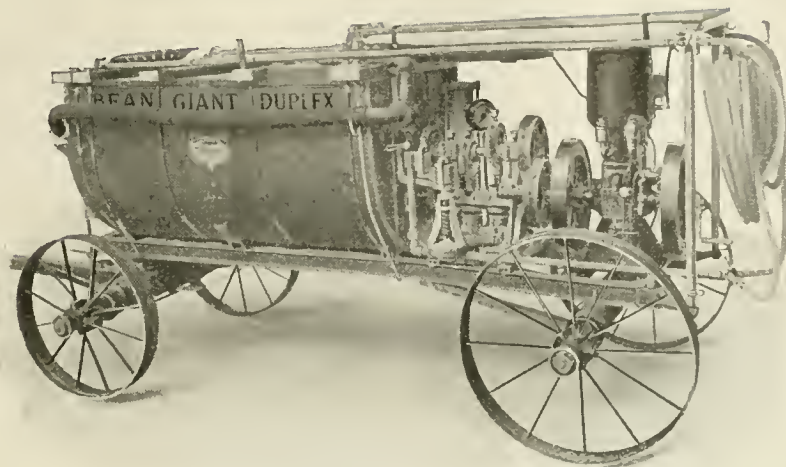
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Capacity 6 gallons per minute, 250 lbs. pressure. Supplies 2 lines of hose.



Bean Power Sprayers

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Capacity 5 gallons per minute, 200 lbs. pressure. Supplies 2 lines of hose.

Bean Pony Duplex

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Bean Eureka Sprayer

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The almost universal use of Bean Power Sprayers throughout the Northwest is not merely a matter of chance. It's because the growers of this wonderfully productive section have learned that the Bean is an indispensable factor in the growing of the most and the best fruit. Clean trees are of vital importance—and nobody knows it better than the apple grower himself! It's such advantages as these that have made "Bean" and "best" synonymous with Northwest apple men:

Constant Pressure—Bean Pressure Regulator holds pressure at any desired point. When not spraying engine runs free, thus saving gasoline and wear and tear on engine and pump.

No Stuffing-Box—and hence, no stuffing-box troubles. Our cylinders are equipped with cup plungers.

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Entered as second-class matter December 27, 1906, at the
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of Congress of March 3, 1879.

Two Grades of Apples.—Some time ago, editorially, the editor of "Better Fruit" advocated packing two grades of apples, stating he believed that growers would adopt this practice in the near future. Already the subject has been taken up and is being seriously discussed by growers in Yakima districts. The subject has been taken up for discussion at the conference of the National Apple Show, but at this date no report has been received of the action taken by the growers at this conference, but this year's experience seems to justify the conclusion previously expressed editorially in "Better Fruit," that it will be wise for the Northwest to discontinue packing so many grades. There seems reason to believe two grades will be sufficient. Of course the first grade should be Extra Fancy. This grade should be packed strictly in accordance with the present grading rules. The standard of Extra Fancy must be maintained absolutely. It seems to the editor that the Fancy and C grade can be combined in one grade, either to be called "Fancy" or, preferably, "Standard," which has been suggested in Yakima. If two grades are to be packed, then the two grades should take all that are packed as Fancy and a reasonable proportion of C grade, including only that which is really first class. The average grower would probably pack out 50 to 60 per cent of Extra Fancy, about 30 to 40 per cent of Fancy and about 10 to 20 per cent of C grade. If the crop is well sprayed, free from pests, then the C grade would probably not exceed 10 per cent very much, if any. Consequently the grower, in leaving out the poorest of C grade, if he leaves out half of them, would only leave out about 5 per cent of the entire crop, which would bring better prices at the vinegar factory than after paying freight to Eastern markets. The other 5 per cent of C grade, which would be

the better apples in the grade, would be only a small proportion of the Standard box, and by being combined with the Fancy would not materially affect the quality of the Standard grade. By combining the best of the C grade with Fancy, calling it Standard or some other suitable name, the grower could afford to make the price on this grade somewhat more reasonable compare to the price on Fancy, thus enlarging the markets. The two-grade plan is suggested editorially in this issue for the purpose of calling attention of all the districts to the matter in order that they may give it proper consideration and come to some agreement before the 1917 apple crop is harvested.

Shortage of Boxes.—For many years apple growers have enjoyed very comfortable apple harvesting seasons. Unfortunately, this year continued severe frosts caused the apples to drop very early, which hurried up the apple-picking season. Owing to a shortage of cars, growers were unable to get boxes as required, consequently many of the growers were seriously delayed in their picking and lost very severely from dropping. Another reason for the shortage of boxes was that growers, when the apples began to fall, picked so much more rapidly than in previous years, many stopping packing altogether, consequently many growers required 50 per cent more to hold the crop unpacked. As they come from the orchard, they usually pack out from 65 to 70 per cent, which meant, this year, growers had to have an excess of 25 to 50 per cent more boxes than they packed out. Invariable in past seasons growers have put off hauling boxes out until the beginning of harvesting. This year the crop overran everyone's estimate, and growers required a great many more boxes than previously ordered. These they were unable to get when the car shortage occurred. A lesson is to be drawn from the condition that existed this year. Growers should make more reliable estimates and provide themselves with enough boxes to hold their entire crop.

These should be hauled out early in the season instead of waiting until harvesting begins. Harvesting begins in most districts about the first of October. After the first of October this year the increased orders for boxes amounted to about 50 per cent in addition to original orders.

Packing Houses and Warehouses.—Never before in the history of the apple industry of the Northwest has a condition prevailed like the one of 1916, when the picking season was shortened by severe frosts, followed later by weather that was in some districts down to 15 and in some districts even below this. Many growers did not have warehouses sufficient to carry their crop, consequently a great many growers were not able to pick their apples because they did not have warehouses to store them in, and most of these were lost by the drop. Such a season may not occur again for many years, yet on the other hand similar conditions may occur again next year; therefore every grower should provide himself with such accommodations as are necessary to put his crop under protective cover and at the same time protect it from extremely low temperature, which may occur again early in the season or before the grower would have the entire crop packed out.

The Quantity of Northwestern Apples. It is very difficult at the present time to give very reliable figures on the apple crop of the Northwest for 1916. Shipments have been heavy, exceeding last year, up to date, about 10 per cent. Yet the markets have not been glutted and prices have ruled pretty fair, generally speaking. While it is true a large quantity remains to be disposed of, yet the losses will reduce this quantity, and it is safe to say now that exaggerated predictions in the beginning of the season will probably not be realized, but about as nearly as anyone could make an off-hand guess at the present time it would seem that the crop of the Northwest would be anywhere from 15,000 to 20,000 cars of shipping apples.



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Apple Prices for 1916.—Apple prices have ruled fair during 1916 for the Northwestern grower. It is possible, if a large quantity had not been lost from the drop and other causes, the price would have been somewhat affected during the rush of the season, that is, during November and December. In order to move the crop, it might have been necessary for Northwestern shippers to make lower prices, but the situation apparently seems to have been relieved, and while it cannot be said at the present time that the loss is so great that it will raise the price to any great extent, it is undoubtedly true that the loss is large enough, so that what remains to be shipped will not be so great in quantity as to glut the markets or crowd any of the principal consuming centers. The distribution is greater this year than in any previous year, covering some 446 cities and towns in the United States during the month of November. The shortage of cars is such that, although there is a large quantity of apples to be shipped, yet they cannot be moved at any time in large enough numbers to seriously affect any of the markets, consequently at the present time it looks as if the grower would get fair prices for apples this season. At the same time if the markets are not glutted, the dealers who handle the Northwestern product will save themselves from any loss through speculation. It is mighty important that the dealers should make money in the apple business. Just as important in a

way as for the grower to make money, because if the dealer does not make a profit he is not very anxious to be a purchaser next year, except at very low figures.

Marketing Cull Apples.—Good markets, like Portland, Seattle, Tacoma and Spokane, have been flooded with low-

grade apples from the districts of the Northwest, which has been a serious menace to shipping concerns securing satisfactory prices for the better grades. It is a fact that many growers, after packing out three grades, box up the rest of the stuff, and instead of sending it to the vinegar factory, ship it out as cooking apples, or under some

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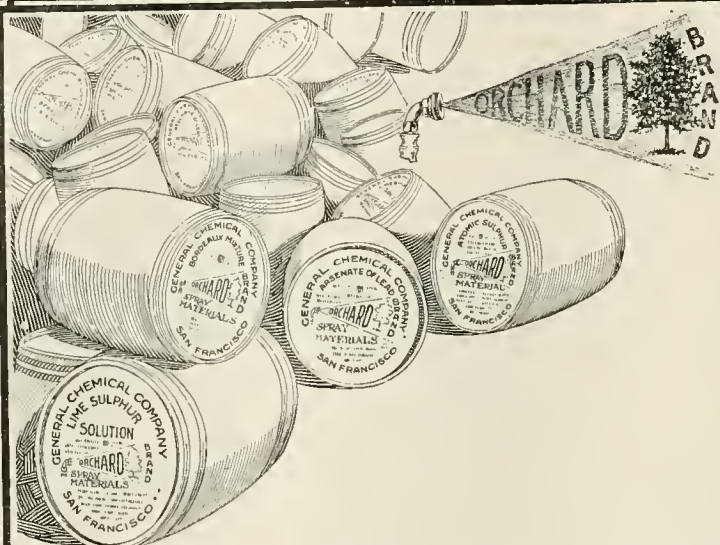
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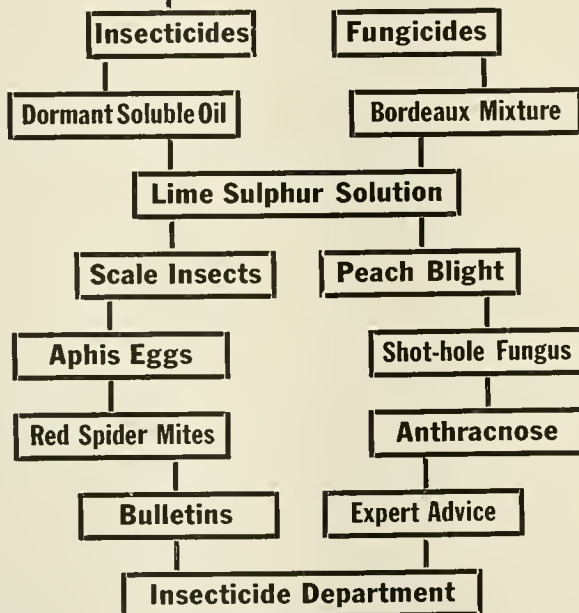
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other name more frequently. It is generally true, with very few exceptions, that the price realized for such stuff does not pay the grower any profit, not even what he could get if he sold them to the vinegar factory or evaporator. Worse than this, however, are the wind-fall apples, which growers continue to persist in packing up and disposing of at very low figures, which is poor stuff, rotting very rapidly, which has a very unfavorable influence on the marketing conditions, and at best growers very seldom realize anything more out of such apples than the cost of preparing them for market—in fact, seldom more than he could get if he sold to the vinegar factory. These two practices must be discontinued if the growers want to realize satisfactory prices on good grades.

1916 Apple Season.—The 1916 apple season was certainly a very peculiar year causing severe loss to many growers who were not properly equipped for housing safely their crops under the weather conditions that prevailed. The loss from the dropping was extremely heavy. The loss from apples unpicked during the cold spell in the latter part of November, when the temperature was very low in many cases, was severe to many individual growers. It is difficult to estimate what the loss may be from these causes at the present time, but in all probability the loss would vary anywhere from 15 to 25 per cent in the various districts.

Barren Trees Made to Produce

By Thos. J. Talbert, Specialist in Entomology,
Kansas State Agricultural College.


ONE of the most successful fruit-growers of Kansas, Mr. John Alter of Belle Plaine, has, by a girdling process, caused barren Mammoth Black Twig apple trees to bear from eighteen to twenty-five bushels per tree. These apple trees were eighteen years old and they had never borne a crop of apples. Mr. Alter had called them fine shade trees, but worthless as fruit trees. The trees are growing on Arkansas River Valley land which is well adapted to the growth of apple trees. The orchard had received good care from the beginning, and other varieties such as Winesap, Jonathan, Ben Davis and Grimes Golden had been fruiting well and heavily in the same orchard for several years. Finally Mr. Alter concluded that something must be done because he was cultivating, spraying and pruning a large area that had never given him any returns. He had heard and read of girdling trees to make them more fruitful. He was also familiar with the barbaric practices of driving rusty nails and railroad spikes into fruit trees to induce them to fruit. After studying the different methods of girdling carefully and getting advice from a member of the Agricultural Experiment Station, he decided to girdle the trees, although most of the advice was against the process.

The work was done in the spring of 1914, just as the buds began to open out into clusters and when the pink in

the opening blossoms began to show. Three different methods of girdling were practiced as follows: (1) A strip of bark varying from one-quarter to one-half inch wide was taken out of the tree about two feet above the ground by cutting around the tree and taking out a piece of bark six or eight inches long. About an inch strip was then left on or skipped and another piece of bark six or eight inches long and one-half inch wide was taken out. This process was continued until the trunk of the tree had been treated all the way round. The wounds were painted at once with white lead and raw linseed oil. (2) This method was similar to the first except the strips between the cuts were left five or six inches wide instead of one inch in width. (3) This method consisted of removing a series of diamond-shaped section of bark from the trunk about two feet above the base. These sections were continued around the tree, leaving a strip of bark about six or eight inches wide between the wounds. The sections of bark removed were eight or ten inches long up and down and about three or four inches in width at the widest place. (4) A half dozen or more trees in the same block were left untreated.

Last year all the trees that were girdled according to method one averaged from 18 to 25 bushels a tree. The trees girdled according to methods two and three bore but very little fruit. In fact they were no more fruitful than the ungirdled trees. The results this year showed up just as they did last year. The trees girdled according to the first method were heavily loaded with fruit, while the other trees had large leaves and made much twig growth, but set very little fruit. Again, there was no more fruit on these trees than there was on the untreated trees. It is interesting to note that in all the girdling work carried on by Mr. Alter he has not damaged a single tree. The wounds were carefully made with clean, sharp tools and they were treated at once with ordinary house paint. As a result not a single case of rot or disease can be found starting in the old wounds. The old practice of driving rusty nails and railroad spikes into apple and pear trees to cause them to fruit has been abandoned. Such work may cause the trees to fruit, but it at the same time allows fungous diseases and rots to become established in the trunks of the trees, which soon destroys them.

The problem which confronted Mr. Alter was, "How can I check the heavy vegetative growth of the trees and cause them to fruit without, at the same time, making them more liable to attacks by fungous diseases and insect pests?" Sowing grass in the orchard and allowing it to remain in sod for a few years had been recommended as a means of checking the growth of the trees and producing fruit. Likewise summer pruning had been urged upon him as the best means of producing



These Heavy Roots Mean Youngest Bearing Orchards

Extra Large
Two-year Apple Trees
Large
Two-year Apple Trees
Medium
Two-year Apple Trees
4 to 6 ft.
One-year Apple Trees
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One-year Apple Trees

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that the bearing stage of a tree is not determined by its age, but by such factors as location, soil, care, cultivation and the quality of the tree planted. Other things being equal, wide-spreading, heavy roots give newly planted trees a quicker start and a faster, more vigorous growth. Such trees make long lived, productive orchards.

What Pacific Coast Fruit Growers Say



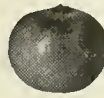
"The trees you sent last spring were a grand success. Some of them made 6 feet growth. They arrived perfectly dormant, while trees here were in leaf and blossom."
—C. F. Cooper, Albany, Oregon.

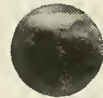
"The trees were fine. Your rush order surprised me; about three days ahead of my estimate."
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"The 10 J. H. Hales I got of you are beating some two-year-old Elbertas put out at the same time."
—E. T. Creasey, Encanto, California.

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—Parker Earle, Pasadena, California.

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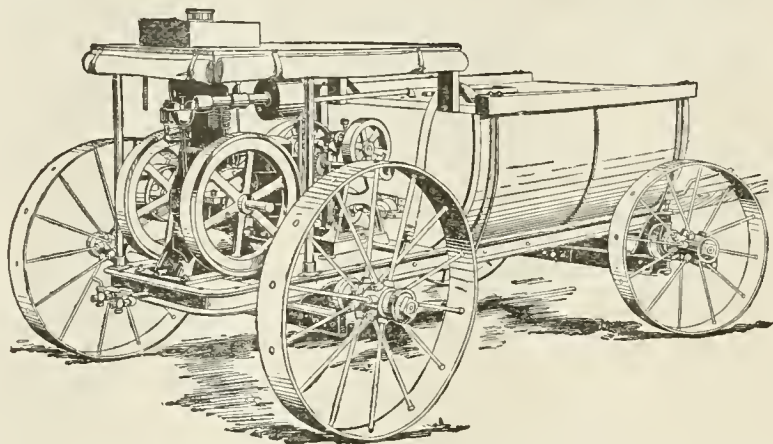
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 Address _____
 Please give County, State and Zip _____

fruit on the barren trees. Neither of these methods were tried out thoroughly, but Mr. Alter's long experience in fruit growing had taught him that insect pests and fungous diseases were much harder to control in a sodded orchard than in a well-cultivated orchard. He also learned that pruning during May and June often caused a heavy flow of sap from wounds down the large limbs and trunks of the trees, making a very favorable place for fungi and insects to get a start. Mr. Alter is watching the experiment closely and he is anxious to know how long the effects of the first-girdling process will last; that is, when will regirdling be necessary in order to keep the trees fruiting under the present cultural

methods. While girdling has never been generally recommended, yet in the hands of the experienced orchardist it may become a useful practice. The work which Mr. Alter is doing is very commendable and no better demonstration of apple-tree girdling can be found anywhere than that on his farm. Horticulturists have been profited and will continue to be benefited by this work.

"Every place and every job have difficulties, the more so when they are new, and while every job has difficulties it also has opportunities. But no job ever grows until brains are applied to it."—Through the Meshes.

THE HARDIE



Hillside Triplex

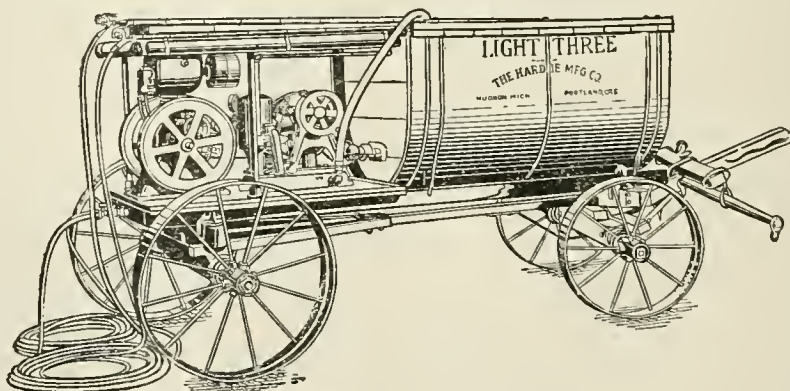
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will save you money in operation costs, will produce better spraying results and can be operated anywhere.

The Light Three



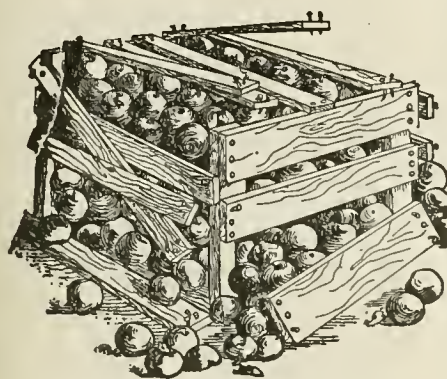
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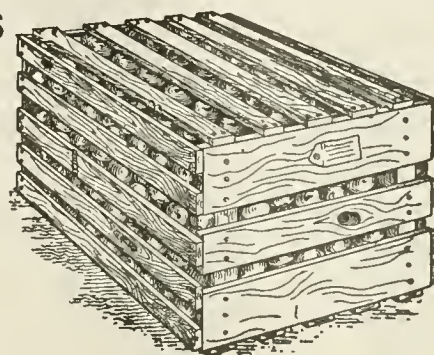
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Cement Coated Nails

Two Destructive Scale Insects

[Office of Information, United States Department of Agriculture]

SPECIALISTS of the United States Department of Agriculture report that the oyster-shell scale and the scurfy scale are more frequently the subject of inquiry by orchardists and others than all other species of scale insects combined, with the exception of the San Jose scale. These scales often kill individual branches and permanently stunt or, in extreme cases, kill the tree. Although the insects winter in the egg stage under the protecting scales and are, therefore, less susceptible to washes that are effective against the San Jose scale, yet such treatment in most cases will reduce their numbers to a point where little injury from them will result. Special spraying may be necessary to hold them in check if spraying for the San Jose scale is not carried on.

The oyster-shell scale is the more important of the two. It occurs in nearly every state in the country and attacks apple, maple, horse chestnut, poplar, willow, lilac, and more than a score of other trees. Shade trees which are not often sprayed are especially susceptible to attack. Maple and poplar trees in some cases are completely incrustated from top to bottom of the trunk. The insect owes its name to its resemblance to a long, narrow oyster shell. The adult female scales are dark-brown in color and about one-eighth of an inch in length. The eggs are concealed beneath them. In the warmer climates there are two broods each year, but in the extreme northern part of the country and in Canada there is only one. The time of the hatching of these broods varies greatly, but it usually occurs through the months of April, May and June.

The scurfy scale is especially common on apple, pear, cherry and peach trees. It does not attack as wide a variety of plants as the oyster-shell scale, and this fact, coupled with its being less widely distributed than the latter, makes it the less harmful of the two. The scurfy scale, like the oyster-shell, winters in the egg condition under the scales. The scale of the female is dirty gray in color and of an irregular pear shape.

Where orchards are pruned and sprayed regularly for the San Jose scale during the dormant period, this will usually be sufficient to hold both the oyster-shell and the scurfy scale in check. Where this is not done and the scales prove troublesome, specific treatment is necessary. The spraying is usually done in the same manner as for the San Jose scale, using the lime-sulphur mixture and applying it when the trees are dormant. If an abundance of young scales hatch in the spring notwithstanding such treatment, additional spraying is necessary. Kerosene emulsion or other contact sprays may be used to kill the newly-hatched insects. Only the insects hit by the spray are killed; therefore the effectiveness of this second spraying depends largely upon whether it is done at the time the scales hatch, and whether the tree is thoroughly covered with a uniform coat. The young insects usually appear during the spring and sometimes in the early summer. Trees which have become infested should be carefully watched during this period to discover the insects when they hatch and to apply the spray at this time when it will do the most good. The insects are

easily distinguished, are light yellow in color, and are found crawling over the trees in great numbers.

Directions for the mixing of lime-sulphur spray and kerosene emulsion are contained in a new Farmers' Bulletin, No. 723, "The Oyster-Shell Scale and the Scurfy Scale," by A. L. Quaintance and E. R. Sasseer, containing complete data on these scales and additional methods for their control.

Kerosene emulsion is made after the following formula: Kerosene (coal oil, lamp oil), 2 gallons; fish-oil or laundry soap (or 1 quart soft soap), $\frac{1}{2}$ pound; water, 1 gallon. First dissolve the soap in boiling water, then remove the vessel from the fire. Immediately add the kerosene, and thoroughly agitate the mixture until a creamy solution results. The stock emulsion may be more conveniently made by pouring the mixture into the tank of a spray pump, and pumping the liquid through the nozzle back into the tank for some minutes. The stock solution, if well made, will keep for some months, and is to be diluted before use. To make a 10 per cent spray (the strength for trees in foliage) add to each 1 gallon of the stock solution about $5\frac{1}{2}$ gallons

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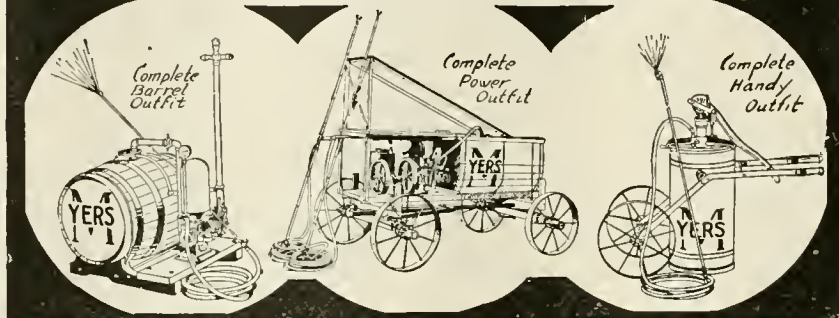
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FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON

of water. For 20 and 25 per cent emulsions (for use on dormant trees and plants) use, respectively, about 2½ and 1½ gallons of water for each 1 gallon of stock emulsion. Agitate the mixture in all cases, after adding the water. The preparation of the emulsion will be simplified by the use of a naphtha soap. No heat will be required, as the kerosene will combine readily with the naphtha soap, in water, when thoroughly agitated. Double the quantity of naphtha soap given in the above formula, however,

will be required, and soft or rain water should be used in making the emulsion. In regions where the water is "hard" this should first be broken with a little caustic potash or soda, as common lye, before use for dilution, to prevent the soap from combining with the lime or magnesia present, thus liberating some of the kerosene, or rain water may be employed.

A good lime-sulphur wash may be made for immediate use by the following formula: Stone lime, 20 pounds; sulphur (flour or flowers), 15 pounds;

water to make 50 gallons. Heat in a cooking barrel or vessel about one-third of the total quantity of water required. When the water is hot add all the lime and at once add all the sulphur, which perviously should have ben made into a thick paste with water. After the lime has slaked, about another third of the water should be added, preferably hot, and the cooking should be continued for one hour, when the final dilution may be made, using either hot or cold water, as is most convenient. The boiling due to the slaking of the lime thoroughly mixes the ingredients at the start, but subsequent stirring is necessary if the wash is cooked by direct heat in kettles. If cooked by steam, no stirring will be necessary. After the wash has been prepared it must be well strained as it is being run into the spray tank. It may be cooked in large kettles, or preferably by steam in barrels or tanks. This wash should be applied promptly after preparation, since, as made by this formula, there is crystallization of the sulphur and hardening of the sediment upon cooling.

Cover Crops in Young Orchards

Continued from last issue

Throughout the entire Okanogan country orchards which are clean cultivated and are on light virgin soil are very susceptible to rosette; yet wherever the soil has been improved with leguminous cover crops this trouble is not found. Often times in answer to my inquiry the farmer will say, "Oh, yes, I used to be bothered with it, but since I put clover or alfalfa in my trees I have never been bothered with it any more."

During the interval between planting and producing, the expense of maintaining the orchard is very great, generally working hardships on the owners, who have paid high prices for the land. Many orchardists are growing nothing between their trees, buying all their produce and going into debt more and more each year, anxiously awaiting the first crop of fruit. The following statistics have been carefully obtained and apply to Okanogan County, where \$350 per acre is paid for a one-year-old orchard, and no returns are obtained from cover crops in the six-year interim until bearing, the orchard will have to produce 1,000 boxes of apples per acre per year, which must sell for one dollar a box in order for the owner to realize an eight per cent interest on his investment. Some men have made money from the cover crops and catch crops while waiting for their trees to bear. One who had thirty acres all in alfalfa this year harvested seventy tons of alfalfa from the first three cuttings. He has been offered \$7.50 per ton for the entire crop, but refuses to sell it. In caring for his alfalfa he has cared for his trees. He has been growing alfalfa among his trees for seven years and says he has never had any trouble selling his hay.

The question of stomach sprays injuring the value of the hay has been brought up. I have never found a farmer yet who complained about this.

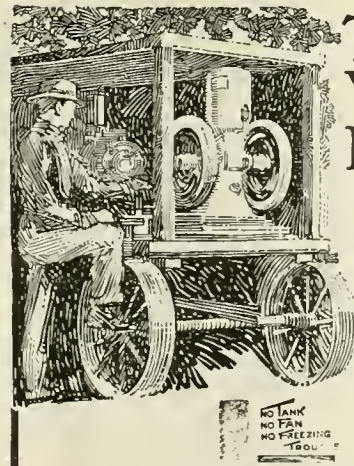
In the last month I have asked thirty-one of the largest cover crop growers, and their reply is that with a reasonable amount of care, and where the hay is in strips, no danger will be experienced. A man who wishes to grow fruit alone and who starts out with a one or two-year-old orchard has a very expensive proposition. The cost of maintaining his family in the country will be greater than in the city. There is no income and a very great expense for five years. The only solution is the cover crop and the money crop system. Splendid vegetables can be grown in any soil which will produce good fruit. From a measured orchard acre one farmer sold this year tomatoes which brought a gross return of \$340. Another man had fifteen acres in corn, which averaged forty bushels per acre, besides the valuable feed. From five acres of strawberries another man cleared \$500. Many farmers report yields of from 200 to 250 bushels of potatoes, while nowhere do roots such as stock beets and carrots thrive better.

The money crop system is to rotate soil building crops with one of the above named crops. Keeping the land planted in legumins for two or three years, then putting in a money crop, then plant a soil building crop again. A well managed twenty-acre tract will, in addition to growing thrifty young trees, produce enough hay and roots for four horses, four cows, fifteen hogs and one hundred and fifty chickens. And most important of all, when the trees are six years of age and ready to begin to bear large crops of fruit, the soil will not be in an exhausted condition, as is often the case where clean cultivation is practiced, but it will be found to be very rich, responsive, and very satisfactory to handle.

To the Growers of Roses

This is to inform you that members of the American Rose Society have been raising money to co-operate in employing a trained plant pathologist to investigate diseases of roses. Sufficient money has now been obtained to assure this work, which is already under way. Doctor L. M. Massey of the New York State College of Agriculture, Cornell University, Ithaca, is conducting the investigations. It is hoped that all growers of roses will now take advantage of this arrangement, not only to obtain what little information there is already at hand, but to co-operate in ways which will be suggested from time to time. Through co-operation with Dr. Massey, the growers will greatly increase the efficiency of the investigation and obtain the greatest returns from their investment.

First of all it seems desirable to make a rose disease survey such as will acquaint us with the various diseases, together with their range and the extent of injury caused by them in this country. In order that this survey may reach its maximum efficiency, it will be necessary for the growers to co-operate by sending specimens of diseased plants. Franked tags will be sup-



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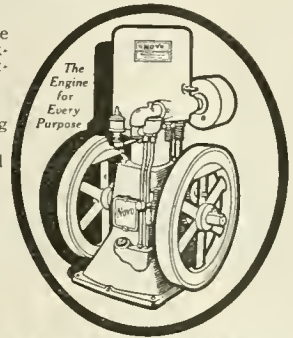
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plied on request. It is hoped that each grower will interest himself in this work sufficiently to collect and send diseased material, together with a brief statement regarding varieties affected, nature and extent of injury, time of appearance of the disease, and other points of interest which may have been noticed. Acknowledgment of receipt of material will be made and such information as is available in the line of control will be given. Many growers will be visited, but it is hardly necessary to

say that it will be impossible to visit all.

The material sent should be freshly collected and should show various stages in the development of the disease. Where roots are sent it will usually be undesirable to enclose any soil. Where convenient, specimens should be mailed so as to reach Ithaca the latter part of the week. Dr. Massey may be away from the city during the early part of the week and the material should receive immediate attention upon its arrival. Place leaves,



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buds, etc., between the leaves of an old newspaper, a few between each two sheets. Then roll into a tight bundle, wrap in stout paper. Tie well, attach one of the franked tags on which you have written your name, address and mail. It will go postage free. Yours for success in this undertaking, H. H. Whetzel, head of the Department of Plant Pathology, New York State College of Agriculture, Cornell University.

The Leaf Blister Mite

Red or green blister-like spots appearing in the early spring on the foliage of the apple and pear are usually due to the leaf blister mite. This is not an insect, but a small animal, in-

visible to the unaided eye, which attacks standard varieties of pear and apple trees and often inflicts serious damage. Where trees are seriously infested, the premature fall of both fruit and leaves may result. In such cases a special application of lime-sulphur wash or other spray may be necessary. Ordinarily, however, the regular orchard spraying is sufficient to control the mite. Badly-infested branches of the pear trees may be cut off and burned. Care should be taken not to confuse the work of the mite with the leaf-spot disease or the results of heavy spraying.

Describing the leaf blister mite, showing how it may be recognized, and giving methods for its control, the

United States Department of Agriculture has issued a new Farmers' Bulletin, No. 722, "The Leaf Blister Mite of Pear and Apple," by A. L. Quaintance. The leaf blister mite passes the winter beneath the bud scales. There it waits for the opening of the buds and attacks the young leaves as soon as they push out in the spring. The tiny animals bore small holes from the underside of the leaves into the interior, where they lay their eggs. This causes the small, pimple-like galls on the upper surface of the leaves. The spots later increase in size, sometimes to one-eighth of an inch, and on the pear tree are red and often brilliantly colored as they grow. In the case of the apple, the eruptions lack the more brilliant coloring and are found more along the margin of the leaf. In both cases the spots finally turn brown or black, and if the pest is abundant the leaves become ruptured and wrinkled.

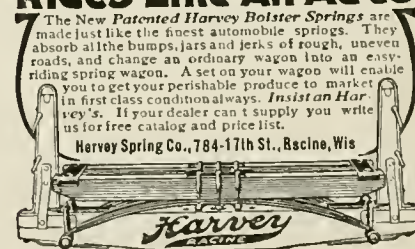
More than 250 varieties of apples are attacked by the mite, injury being especially severe on some well-known commercial sorts, such as the Ben Davis, the King, Baldwin, Rhode Island Greening, and the Williams Favorite. Where orchards are seriously infested, as has been noted in New York State, lime-sulphur washes give excellent results. They avoid the injurious effects upon fruit buds which sometimes result from the use of oil sprays. The wash should be applied thoroughly, coating the twigs and branches.

A standard solution of kerosene emulsion may also be used. The stock solution should be diluted with five parts of water for spraying purposes. One application should be given in the late fall, as soon as most of the leaves have fallen, and another in the following spring, before the trees put out foliage. If it is possible to give only one treatment, the sprays should be used in the fall. At this time many of the mites have not yet gone to the bud scales, but occur in the down covering the young wood, and hence are more easily killed.

Nothing is impossible; there are ways which lead to everything, and if we had sufficient will we should always have sufficient means.—Le Rouchefoucauld.

Die when I may, I want it said of me by those who know me best that I always plucked a thistle and planted a flower where I thought a flower would grow.—Abraham Lincoln.

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Northwest Apple Movement for November

Apple shipping concerns and growers can spend some time very profitably in looking over the following list of towns to which apples of the Northwest have been shipped from November 1st to 24th, inclusive. Comparisons should be made with October shipments, which appeared in the November edition. Thirty towns have been added to the list during the month of November, which shows an increase of approximately 10 per cent wider distribution. Boston received 106 cars, Minneapolis 241, New York 409, Philadelphia 66. The population of Philadelphia is about twice that of Boston, and Philadelphia received less than half as many cars as Boston, yet Boston is located in Massachusetts, and the New England States have long been celebrated for producing large quantities of good apples. Many other comparisons can be drawn, which will prove very positively that many cities have not received or consumed the quantity of Northwestern apples that they should in accordance with what are being consumed in other cities. There must be reasons. The subject is worthy of careful study. It is believed that by careful investigation the conditions, whatever they are, may be overcome so that arrangements could be made that each city would consume its just proportion of Northwestern apples. Careful study of the list of cities will show that some very small towns have received apple shipments in car lots, and it is also true there are many towns in the United States of medium size that should receive in car lots that are not included in this list. Everybody is extremely busy at the present time, therefore it seems wise to postpone a more detailed analysis of the lessons that may be drawn from these lists until some later issue of "Better Fruit." It is our intention, toward the end of the season, to analyze this list more completely, calling special attention to some of the cities which have not assumed their just proportion, and also mentioning other cities in the United States which should receive Northwestern apples and are not.

Albuquerque, N. M.	1	Bridger, Mont.	2
Atlanta, Ga.	1	Burt, N. Y.	3
Avon, Minn.	1	Bowman, N. D.	2
Am'rie'n Falls, Ida.	1	Bozeman, Mont.	5
Almena, Kan.	2	Bridgeport, Conn.	6
Aberdeen, S. D.	23	Birmingham, Ala.	4
Arimo, Idaho	1	Bangor, Me.	1
Abilene, Tex.	5	Beach, N. D.	1
Arlington, Kan.	1	Billings, Mont.	19
Anaconda, Mont.	2	Bismarck, N. D.	18
Austin, Tex.	6	Baker, Oregon	1
Altamont, Kan.	1	Belgrade, Mont.	1
Ashley	1	Bowman, Mont.	2
Arco, Idaho	1	Brush, Colo.	2
Albert Lea, Minn.	1	Braddock, N. D.	1
Alexandria, La.	1	Bynum, Mont.	1
Blackfoot, Idaho	2	Bisbee, Arizona	1
Bonham	1	Buhl, Idaho	1
Bancroft	1	Biggersville, Pa.	2
Bend, Oregon	1	Bellinger, Wis.	1
Broadhead, Wis.	1	Ballard, Wash.	1
Black Duck, Minn.	1	Benito, Mass.	1
Brady, Mont.	2	Brownsville, Tex.	1
Boston, Mass.	106	Big Springs, Tex.	1
Baltimore, Md.	23	Beloit, Wis.	1
Beaumont, Tex.	2	Browning, Mont.	1
Brigham, Utah	1	Brewster, Minn.	1
Butte, Mont.	23	Brownwood, Tex.	1
Buffalo, N. Y.	9	Chicago, Ill.	318
Birmingham, Ala.	16	Chamberlain, S. D.	1
Burt, N. Y.	22	Carmol	1
Boise, Idaho	11	Conrad, Mont.	3

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Culbank, Mont.	17	Houston, Tex.	13
Claremont, S. D.	2	Helena, Mont.	10
Cameron, Man.	2	Hazellon, N. D.	1
Cincinnati, Ohio.	17	Holquiam, Wash.	2
Cody, Wyo.	1	Hopewell, Ill.	1
Calgary, Alberta.	7	Hazelton, Idaho.	1
Cucro, Tex.	1	Boxie	1
Clinton, Iowa.	1	Herndon, Kan.	1
Chinook, Mont.	1	Havre, Mont.	6
Crawford, Neb.	5	Hastings, Neb.	1
Cumberland, Iowa	1	Huron, S. D.	1
Council Bluffs	3	Hartford, Conn.	2
Condon, Kan.	1	Hottinger, N. D.	4
Cedar Rapids, Ia.	2	Hanna, Wyo.	1
Coffeyville, Kan.	1	Horton, Minn.	2
Camanche, Okla.	1	Hale, Mo.	1
Columbus, Ohio.	3	Harrington, Okla.	1
Cheyenne, Wyo.	14	Hill City, S. D.	1
Corsicana, Tex.	5	Hebron, N. D.	1
Cambria, Iowa.	1	Hersey City, N. J.	1
Centralia, Wash.	1	Haxtun, Colo.	1
Crookston, Minn.	5	Ithaca, N. Y.	1
Cando, N. D.	1	Idaho Falls, Idaho	2
Colorado Springs.	2	Indianapolis, Ind.	4
Caldwell, Idaho	1	Jersey City, N. J.	3
Cleveland, Ohio	6	Jamestown, N. D.	9
Chehalis, Wash.	2	Jacksonville, Fla.	2
Columbus, Neb.	1	Java, S. D.	1
Creelman, Sask.	1	Kansas City, Mo.	60
Canova, S. D.	1	Kamsack, Sask.	1
Cresco	1	Killdeer, N. D.	1
Casper, Wyo.	1	Krupp, Wash.	1
Coffee Creek, Mont.	1	Klamath Falls, Ore.	1
Cass Lake, Minn.	1	Kenmore, N. D.	1
Crosby, Minn.	1	LeRoy, N. Y.	16
Cartonville	1	Lewiston, Mont.	5
Denver, Colo.	42	Laurel, Mont.	5
Dallas, Tex.	23	Laramie, Wyo.	2
Duluth, Minn.	35	Lethbridge, Alberta	7
Danbury, Neb.	1	Langdon, N. D.	2
Deer Lodge, Mont.	1	Los Angeles, Cal.	36
Des Moines, Iowa.	11	LaCross, Wis.	1
Denison, Tex.	2	Lincoln, Neb.	8
Devils Lake, N. D.	3	Little Rock, Ark.	4
Detroit, Mich.	4	Lyons, N. Y.	12
Dalton, Minn.	2	Logan, Utah	2
DeBueque, Iowa.	3	Lamond, Alberta.	1
Dickinson, N. D.	12	Lenamon, S. D.	2
Dike, Iowa	1	Lake Park, Minn.	1
Dunsmuir	2	Livingston, Mont.	4
Dillon, Mont.	2	Long Island, Kan.	1
DeBois, Pa.	1	Lester, Neb.	2
Drake, N. D.	1	Logansport, Ind.	1
Douglas, Ariz.	2	Lakota, N. D.	1
Drummond, Mont.	1	Lake Charles, La.	1
Davenport, Iowa.	2	Llano, Tex.	1
Detroit, Minn.	1	Leith, N. D.	1
Ditworth, Minn.	1	Minot, N. D.	17
Dighton	1	Minneapolis, Minn.	241
Deadwood, S. D.	1	Muskogee, Okla.	1
Edmonton, Alberta	5	Milw'd Spur, Utah	1
Elmira, N. Y.	6	Mitchell, S. D.	5
Ennis, Tex.	1	McAlester, Okla.	1
Edison, N. D.	1	McCauley	1
El Paso, Tex.	13	Minn. Trns. Minn.	32
Emmett	3	Milwaukee, Wis.	20
Everett, Wash.	6	Milk River, Alberta	1
Eureka, Kan.	2	Mooselaw, Sask.	6
Emporia, Cal.	2	Manchester, N. H.	1
Eastby	1	Minidoka, Idaho.	1
Evansville, Ind.	3	Medina, N. Y.	2
Eagle Bend, Minn.	1	Muskogee, Okla.	1
Enterprise, Oregon	1	Malvern, Iowa	2
Eureka, S. D.	1	Malla, Mont.	1
Elsworth, Kan.	1	Marshall, Tex.	2
Fort Morgan, Colo.	1	Memphis, Tenn.	3
Forsythe, Mont.	3	Marysville, Cal.	3
Fort Worth, Tex.	45	Middleton, Idaho.	1
Fargo, N. D.	16	Mandan, N. D.	1
Fort Smith, Ark.	3	Missoula, Mont.	6
Fairmont, Neb.	1	Muskogee, Okla.	3
Fernie, B. C.	2	Miles City, Mont.	1
Fort Fairfield, Me.	1	Mott, S. D.	1
Freeport, Ill.	2	Morris, Minn.	1
Fort Wayne, Ind.	2	Morrison	1
Fredericksburg	1	Montpelier, Idaho.	1
Fergus Falls, Minn.	1	Medicine Hat, Alb.	4
Flasher, N. D.	1	Miles City, Mont.	2
Fort Clark, N. D.	1	Moore	1
Fort Morgan, Colo.	1	McCloud	1
Fresno, Cal.	2	Moorefield, Neb.	1
Franklin, Mont.	1	Muskogee, Okla.	2
Fairfield, Idaho.	1	Moorefield, Neb.	1
Great Falls, Mont.	13	McCammon, Idaho	1
Grand Island, Neb.	3	Montague, Cal.	1
Grand Forks, N. D.	5	Midvale	1
Glasgow, Mont.	3	McDonald, Kan.	1
Grainfield, Kan.	1	Meridian, Idaho.	1
Groton, S. D.	1	Michland, Idaho.	1
Gothensburg, Neb.	1	Malad, Idaho	1
Glendive, Mont.	4	Montreal	1
Gregory, S. D.	1	New York	109
Globe, Ariz.	1	New Lond'n, Conn.	1
Genesee, Idaho	1	Nashville, Tenn.	8
Gull Lake, Sask.	1	New Orleans	14
Great Falls, Mont.	1	Ness City, Kan.	1
Gillette, Wyo.	1	Nampa, Idaho	15
Galesburg, Ill.	1	North Bend, Ore.	1
Gorham, Kan.	1	Norton, Kan.	1
Gooding, Idaho	2	Norfolk, Kan.	2
Gillette, Wyo.	1	New Rock'rd, N.D.	1
Giltner, Neb.	1	Norris, Mont.	1
Geraldine, Mont.	1	New Salem, N. D.	1
Goodrich, N. D.	1	North Platte, Neb.	1
Gering, Neb.	1	Norris, Mont.	1
Hutchinson, Kan.	1	Newberg, N. D.	1
Hannibal, Mo.	10	Niagara, Oregon	1
Hinsdale, Mont.	1	Ogden, Utah	11
Higmoore, N. D.	1	Omaha, Neb.	131
		Okla'h'ma City, Ok.	2

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Ottawa	1	Stockton, Cal.	4
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Preston	1	Trinidad, Colo.	1
Peoria, Ill.	1	Tuton, S. D.	1
Puyallup, Wash.	1	Tucson, Ariz.	1
Rugby, Mont.	1	The Dalles	1
Redfield, S. D.	1	Toronto, Ontario	3
Racine, Wis.	2	Topeka, Kan.	1
Regau, N. D.	1	Towusend, Mont.	1
Regina, Sask.	9	Twin Falls, Idaho	1
Red Lake Falls, Minn.	1	Toledo, Ohio	2
Reno, Nevada	2	Twin Valley, Minn.	1
Rupert, Idaho	3	Three Forks, Mont.	1
Rexburg, Idaho	1	Turtle Lake, N. D.	1
Ree Heights, S. D.	1	Timber Lake, S. D.	2
Rock Spr'gs, Wyo.	7	Texarkana, Ark.	2
Rosebud, Mont.	1	Upton, Wyo.	1
Roundup, Mont.	1	Ulica, N. Y.	1
Riverton, Neb.	1	Upland, Neb.	1
Raymond, Minn.	1	Vancouver, B. C.	17
Rhome, Tex.	1	Vermillion, S. D.	1
Rockford, Ill.	2	Valley City, N. D.	2
Red Lodge, Mont.	1	Vulcan, Kan.	1
Rapid City, S. D.	1	White Fish, Mont.	29
Ruby	1	Williston, N. D.	5
St. Johns, N. B.	12	Worcester, Mass.	1
Salem, Oregon	3	Weiser, Idaho	1
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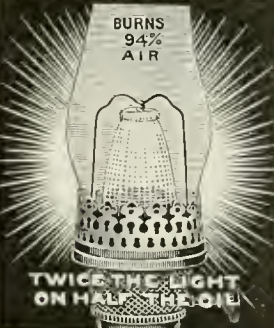
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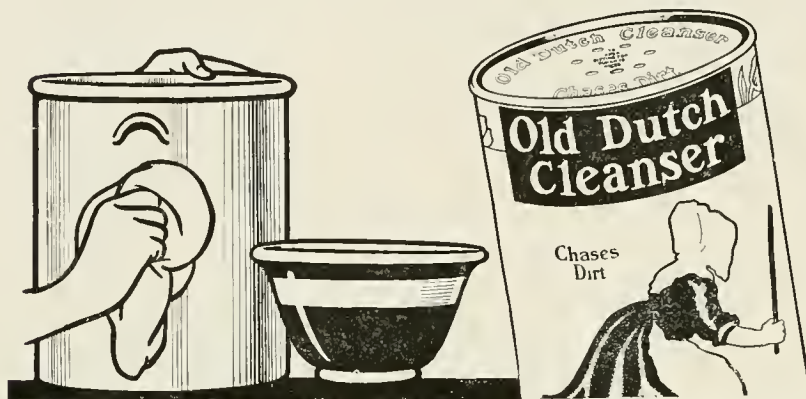
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Maintaining Soil Fertility, Etc.

Continued from page 8

usually assigned to phosphoric acid, potash and nitrogen in commercial fertilizers, and are possibly somewhat too high from a practical standpoint. On the other hand, it must be borne in mind that no account is taken of the value of manure for improving the mechanical condition, drainage of soils and the effect manure has on the chemicals of the soil. Every forkful of manure contains millions of bacteria which have a beneficial effect on the soil to which it is applied. I may say at this point that a better understanding of the bacteria of the soil will explain many of the difficult problems that confront the soil chemist and the soil physicist.

Rotation of Crops.

The influence of rotation in the yield of crops is very marked and is well illustrated by the Rothamsted wheat experiments. The yield of wheat grown continuously without manure for fifty years has been reduced from 33½ bushels, the average maintained on the best fertilized plot, to 15 bushels. Where wheat has been rotated with roots, barley, clover, beans, or fallow, the wheat being sown every fourth year for forty-four years, without the addition of manure or fertilizers of any kind, the yield of wheat has not been sensibly reduced.

The ultimate success of the fruit grower of Washington will depend on his ability to maintain the fertility of his land. Our orchards have been planted, for the most part, on sagebrush or pine lands, and in most cases the land was cleared of the native growth and planted directly to trees. Thus there was little or no vegetable matter in the soil, and since our growers, until recently, have been very insistent on clean cultivation, and stable manure is scarce, on account of the scarcity of farm animals, little has been added. Does it not stand to reason that continued cropping to any tree fruit will bring the same disastrous results that befell the wheat growers?

On account of the nature of his plants (trees) the grower must grow his crop on one parcel for land for a long period of time. Therefore it is difficult or almost impossible to get the beneficial effects of rotation of crops. How, then, are we to maintain the fertility of our orchard lands? This can be answered in one statement: apply barnyard manure. The judicious use of "companion crops," "shade crops" or "cover crops" in the orchard will take the place of rotation of crops on the general farm and also add humus and nitrogen when legumes are used. The "companion crop" and stock make it possible to have barnyard manure on the fruit farm. Alfalfa makes one of the best and cheapest companion crops and is successfully grown in many orchards in the Northwest. After it is established in the orchard it is handled in one of the following ways with success, depending on the soil and the man: (1) Disk thoroughly in the spring and let grow the balance of the season with-

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out any more work. (2) Disk thoroughly in the spring and clip the alfalfa as often as it reaches eighteen inches in height and allow the hay to remain in the orchard for a muleh. (3) Disk thoroughly in spring and harvest one or two crops of hay. Some growers plow shallow in the spring instead of using the disk, others use the alfalfa renovator instead of the disk. There are a few who do their disking in the fall. The third way is the best, provided the hay is fed on the place and the manure is put back on the orchard.

Many other crops can be grown in the orchard where moisture is abundant, and they should all be fed on the place. A shade crop is a crop that is grown during the summer to shade the soil and is plowed under in the fall. In orchards where the moisture is not sufficient to support the trees and a companion crop, cover crops can be used. Cover crops are sown in late summer or early fall and plowed under the following spring. Wheat, rye, barley, rape, turnips, peas and vetch are used for cover crops. We have found hairy or winter vetch gives the best results. One seeding is all that is necessary, provided it is not plowed under before it blooms. After it is plowed clean culture can be practiced until fall, and before winter the soil will be covered with a mat of vetch. Vetch furnishes large quantities of humus and fibre to the soil and it is a great nitrogen gatherer. It becomes a weed, but is a good weed in the orchard.

Barnyard manure is the only remedy for orchards that are not sufficiently supplied with moisture to grow cover crops.

It is not advisable to use commercial fertilizers on a large scale until they have been tried with success on a small scale. They are expensive and do not add humus.

The growing of one crop on the "ranch" is rapidly becoming a thing of the past, because it depletes the soil fertility and gives an income but once in the year.

You must apply the methods best suited to your conditions.

World Economy of Food.

The International Institute of Agriculture at Rome has issued an extensive report on the food question, which it says is very grave. It is estimated that 2,300,000,000 bushels of wheat will be consumed in the year ending July 31, 1917, which will decrease the world's surplus to 46,000,000 bushels. The world's surplus of the five cereals, wheat, rye, barley, oats and corn, is placed at 533,000,000 bushels. This includes the stocks in Russia, Roumania and Bulgaria that cannot be exported.

It is announced that a steamship line is to be established between Japan and Brazil. The first steamer, which will be of 5,000 tons register, will leave Japan next February, carrying in addition to cargo 900 emigrants. It is stated that beginning with February 5,000 Japanese will be sent to Brazil each year, to be employed in the cultivation of rice, beans, potatoes, onions and coffee.



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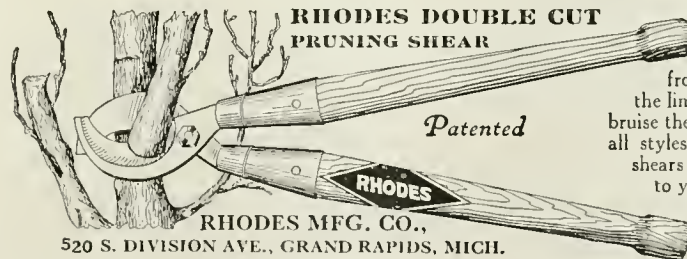
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"Bulk" Pruning Question

Continued from page 6.

little, if at all, in general form; but the rate of growth of nearly all of its individual parts is accelerated, and the ways in which they function are materially changed, for strengthened and enlarged spurs bear fruit more regularly. Here, then, is a type of pruning that has apparently affected the tree as a whole, affected the tree as a whole because affecting nearly all of its individual parts. However, it is a type of pruning that must be regarded as the opposite of bulk pruning. Of course it is an extreme case, but nevertheless it serves to illustrate the point that it is desired to emphasize.

Interpretation of the Facts Presented.

A consideration of the facts that have been cited leads unmistakably to at least one conclusion, namely, that the radius of influence within the tree of any pruning (i.e., the cutting out or cutting back of any particular shoot or branch) is comparatively narrow. Parts close to the pruning wound, or perhaps close to space left by the removal of a branch, show a response to the pruning treatment. Roughly speaking, other parts of the tree do not. In other words, pruning does not directly effect the tree as a whole, but it affects it only indirectly through its effect upon individual parts. Why such is the case is, of course, another question. No attempt is made to suggest an answer here. Probably much careful work will have to be done before a satisfactory answer will be forthcoming. Meanwhile the principle established may be of use, even though we are not able fully to explain it.

Application of the Principle Established to Pruning Practice.

In order that a few of the applications of the principle that has just been stated to pruning practice may be better understood it may be well to make a brief statement regarding some of the main objects that the grower should have in mind when pruning. In other words, why do we prune? There are of course many ends sought in pruning, the relative importance of which vary with soil, elevation, temperature, humidity, disease, variety and many other factors, factors both environmental and those artificially imposed by market demands or the whims of the grower. It is not the intention to attempt even to mention these here. It will be generally agreed, however, that primarily pruning must seek to bring trees into bearing at a reasonably early age and then keep them bearing large quantities of high grade fruit, and this must be done with due regard for keeping down the cost of production. Limiting the discussion now to apples and pears, it may be stated that at least in the case of older trees by far the most of the fruit is borne upon fruit spurs. Pruning should consequently aim to lead to the production of large numbers of fruit spurs and to the regular bearing of those already possessed by the tree, together with the maintenance of a reasonable amount of vegetative growth. It has

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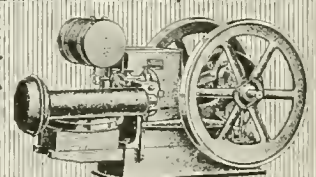
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just been pointed out that bulk pruning is mainly influential in the stimulation of watersprouts, and not the main fruit spur system or normal vegetative growth of the tree. There is certainly very little reason to believe that watersprouts can, or at least do, take the place of the normal vegetative (shoot) growth in contributing to the welfare of nearby fruit spurs and to the welfare of the tree as a whole. Furthermore, they are comparatively slow in developing a fruit spur system of their own; so it may be questioned whether or not they are really very useful in the economy of the average tree (except of course for special purposes, such as rebuilding a new top in cases of renovation, etc.). To stimulate the formation of fruit spurs and to increase the efficiency of those already in our possession requires that pruning must be afforded close to the point where we wish them formed or where they already are, for we have seen that the radius of the influence of pruning is comparatively narrow. This in turn means light, or rather fine, as opposed to coarse pruning. In other words, it means pruning that is distributed throughout the tree top, for the spurs and normal vegetative shoots are thus distributed. Our tendency must be in the direction of the removal or cutting back of a larger number of smaller branches. It will be necessary more and more to get away from the idea of what has been called bulk pruning and to give greater attention to detail. Theoretically, pruning should concern itself mainly with shoots and spurs rather than with older or larger wood. Practically, it should be limited to the shoots, spurs and smaller branches. Of course, in the case of trees that have been neglected for several years, some exceptions must be made. Just because the removal of a larger number of smaller branches necessitates the exercise of better judgment and perhaps takes a little more time and requires greater skill than the removal of a smaller number of larger ones, this should not deter us from the best method of procedure.

Carrying the line of reasoning a step further, it becomes evident that pruning should be a regular, rather than an irregular orchard operation. This is a statement that most growers know to be true from observation and experience, though the reasons therefor may not have been clearly understood. However, the points that have been brought out furnish an explanation of some of the characteristic results following irregular pruning. Trees left unpruned for several years usually seem to demand the removal of some of the larger branches or limbs. This approaches the bulk type of pruning that has been described, and as such stimulates new vegetative growth, rather than invigorating the older fruiting wood; and new vegetative growth in trees of this sort is as apt to increase as to diminish difficulties. If the pruning that is to be afforded our orchard trees is to be such as will help establish and maintain rather than disturb a proper balance between vegetative and fruiting wood it must be attended to every year.

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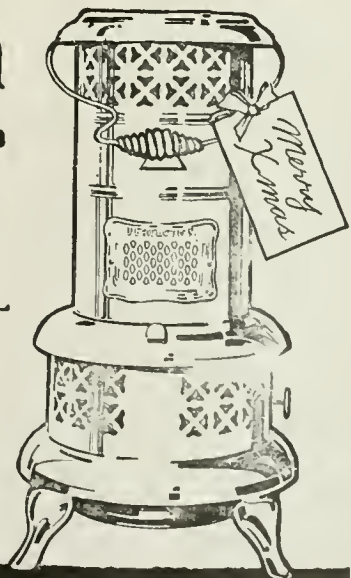
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What has been stated should not be regarded as an argument against occasional heavy pruning, i.e., the removal of a considerable amount of growth. Though heavy pruning as commonly done is bulk pruning, this is not necessarily the case. It may consist in the removal of a large amount of shoot growth and small branches, and thus not give rise to watersprouts, but on the contrary stimulate the normal vegetative growth and fruit spur system of the tree. The instance of spur pruning cited in this article is evidence on this point.

Some Questions Raised by the Facts Presented.

That the radius of influence of a particular pruning cut is comparatively narrow seems to be established beyond all question. Just how far that influence extends is only one of a great many unanswered questions. Is the radius of influence of a pruning cut the same when a limb is cut back as it is when it is cut off entirely? Does it depend more upon the size of the wound or the age of the limb? Is it felt to as great a degree by fruiting wood in the neighbor hood of a cut as by more strictly vegetative tissue? Does it depend to any extent upon the season when the pruning is done? For instance, is the radius of influence from a cut made July 1 greater or less than it would be from a similar cut made March 1? To what extent are the fruit spurs of a tree virtually independent of the tree as a whole, and to what extent are the fruit spur and vegetative systems interdependent? If interdependent to a certain degree, how close to a particular shoot must a particular spur be in order to be benefited or injured by it? Is the radius of influence of a particular pruning cut greater or less than that of the part removed? Finally, to what extent are parts of tree tops independent and to what extent are they interdependent? These and other questions are at present unanswered. They are not easy problems to solve, yet they must be solved if we are to have a more perfect understanding of the principles underlying pruning practice.

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VOLUME XI

JANUARY, 1917

NUMBER 7

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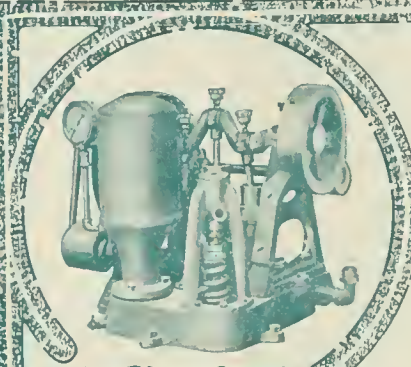
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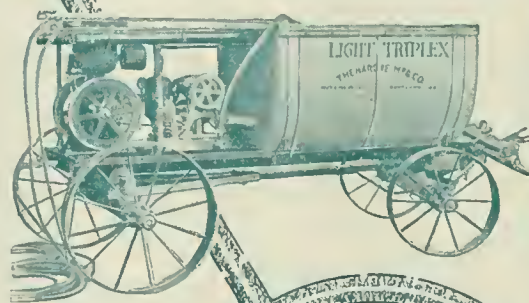


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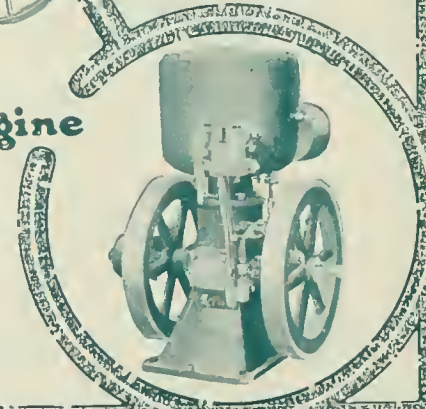
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Fungus Sprays—Based on 50 Different Observations

Report Made by Sam G. Campbell, Chief Inspector of the Apple Growers' Association, Hood River, Oregon

[EDITOR'S NOTE.—The following observations afford some very interesting information in reference to spraying for fungus. Particularly valuable for the reason that the exhibits are the work of fruit growers in a practical way in commercial orchards. It should be noted that the spraying program is for the whole orchard, not for a few rows or a few trees, spraying in a particular manner in the same very thorough way, which is beyond the capacity of the average grower with a large orchard. It may be noted in addition that the fruit growers of Hood River Valley have profited from their experiences of 1915, and through the assistance of the experiment station have produced a crop of apples this year that is practically free from scab, many growers having less than one per cent and very few to exceed five per cent. It is the intention in the next issue of "Better Fruit" to give a program of the spraying methods that have been followed this year, which have been extremely successful in controlling scab.]

IN presenting the following information for your consideration and benefit, I desire to say that the investigations cover 50 orchards in Hood River valley. In each case the number of sprays, time applied and the fungicides used are stated in the various exhibits, also the strength which is used in each one of the fungicides.

The dormant spray means the fall application of bordeaux. The spray referred to as delayed dormant means the spray which is usually applied as the buds begin swelling, which in some instances is extended by the growers after the buds have opened out and the leaves advanced quite conspicuously. The percentages of scab given are at thinning time.

The estimates are furnished by the growers and in my judgment are about correct, as nearly as could be determined by estimate without actual counts.

The main object of this information is, first, to show that where the greatest number of sprays were used, the cleanest crops were obtained; second, to show that certain omissions in spraying were more serious than others; third, that certain fungicides gave better results than others.

First, I will give you the number of sprays and data in reference to each individual orchard. These are classified in exhibits—all growers who followed a spraying program which was alike are classified under "Exhibit A." The numbers after Exhibit A and B indicate the number of growers who followed the same system. These exhibits run from "A" to "S." In some exhibits there are half a dozen or more, and in some there is only one example of the spraying method. Where there are more than one the average percentage of scab at thinning time for the entire number is given.

I will now proceed to give you the program, followed by the different ex-

hibits, and later furnish observations and conclusions:

Exhibit A-1: Fall bordeaux, delayed lime-sulphur 1-9. Delayed dormant, semi-dormant, pink, calyx and ten days. Six sprays, 5 per cent fungus.

Exhibit B-1: Fall bordeaux, lime-sulphur 1-10. Delayed dormant, lime-sulphur 1-40, pink, calyx and ten days. Five sprays, 5 per cent fungus.

Exhibit B-2: Fall bordeaux, delayed dormant lime-sulphur 1-12, pink lime-sulphur 1-25, calyx lime-sulphur 1-30, ten days lime-sulphur 1-40. Five sprays, 10 per cent fungus.

Please note this orchard had 20 per cent fungus in 1914.

Exhibit B-3: Fall bordeaux, delayed dormant lime-sulphur 1-10, pink bordeaux 4-4-50, calyx lime-sulphur 1-35, ten days lime-sulphur 1-40. Five sprays, 15 per cent fungus.

Average fungus Exhibit B 10 per cent. The average fungus in Exhibit B was increased by B-2 using an insufficient quantity, applying only two gallons of spray for trees about 13 years old; otherwise Exhibit B would probably have shown an average of about from 5 to 7½ per cent fungus.

Exhibit C-1: Delayed dormant lime-sulphur 1-10, pink, calyx and ten days lime-sulphur 1-40. Four sprays, 5 per cent fungus.

Exhibit D-1: Fall bordeaux, delayed dormant lime-sulphur 1-20, pink and calyx lime-sulphur 1-35, ten days atomic sulphur 6 pounds-100 gallons. Five sprays, 10 per cent fungus.

Exhibit D-2: Fall bordeaux, delayed dormant lime-sulphur 1-10, pink lime-sulphur 1-30, calyx lime-sulphur 1-33, ten days atomic sulphur 6 pounds-100 gallons. Five sprays, 25 per cent fungus.

Exhibit D, average fungus 17½ per cent.

Exhibit E-1: Fall bordeaux, delayed dormant lime-sulphur 1-20, pink lime-sulphur 1-35, calyx atomic sulphur 12 pounds-100 gallons, ten days atomic sulphur 10 pounds-100 gallons. Five sprays, 15 per cent fungus.

Exhibit F-1: Fall bordeaux, pink lime-sulphur 1-20, calyx lime-sulphur 1-36, ten days atomic sulphur 6 pounds-100 gallons. Four sprays, 5 per cent fungus.

Exhibit F-2: Fall bordeaux, pink lime-sulphur 1-20, calyx lime-sulphur 1-35 part of orchard, bordeaux 4-4-50 other part; ten days bordeaux 2½-4-100. Fungus 15 per cent.

Average fungus Exhibit F 10 per cent; four sprays.

Exhibit G-1: Fall bordeaux, pink lime-sulphur 1-15, calyx lime-sulphur 1-38. Three sprays, 20 per cent fungus.

Exhibit G-2: Fall bordeaux, pink lime-sulphur 1-25, calyx lime-sulphur 1-38. Three sprays, 20 per cent fungus.

Average fungus Exhibit G, three sprays, 20 per cent.

Exhibit H-1: Fall bordeaux, delayed dormant lime-sulphur 1-20, calyx lime-sulphur 1-35, ten days 1-40. Four sprays, 10 per cent fungus.

Exhibit H-2: Fall bordeaux, delayed dormant lime-sulphur 1-10, calyx lime-sulphur 1-35, ten days bordeaux 4-5-50. Four sprays, 30 per cent fungus.

Exhibit H-3: Fall bordeaux, delayed dormant lime-sulphur 1-10, calyx lime-sulphur 1-35, ten days bordeaux 4-5-50. Four sprays, 30 per cent fungus.

Exhibit H-4: Fall bordeaux, delayed dormant bordeaux 6-6-50, calyx lime-sulphur 1-40, ten days lime-sulphur 1-30. Four sprays, 35 per cent fungus.

Average fungus Exhibit H 26¼ per cent. Four sprays, pink spray being omitted.

Exhibit I-1: Fall bordeaux, delayed dormant lime-sulphur 1-11, pink lime-sulphur 1-28, calyx lime-sulphur 1-28. Four sprays, 20 per cent fungus.

Exhibit I-2: Fall bordeaux, delayed dormant lime-sulphur 1-12, pink lime-sulphur 1-25, calyx lime-sulphur 1-35. Four sprays, 25 per cent fungus.

Average fungus Exhibit I 22½ per cent. Four sprays.

Exhibit J-1: Pink lime-sulphur 1-20, calyx lime-sulphur 1-25. Two sprays, 30 per cent fungus.

Exhibit J-2: Pink lime-sulphur 1-10, calyx lime-sulphur 1-30, ten days atomic sulphur 7 pounds-100 gallons. Three sprays, 35 per cent fungus.

Average fungus Exhibit J, two and three sprays, 32 per cent.

Exhibit K-1: Delayed dormant lime-sulphur 1-10, calyx lime-sulphur 1-15, ten days lime-sulphur 1-15. Three sprays, 15 per cent fungus.

[Note—Rather exceptional; good result probably due to delayed dormant being put on late enough to be near early pink and extra strength of lime-sulphur was used in calyx and ten days. This strength, however, is dangerous, and may cause russetting of fruit and burning of foliage.]

Exhibit L-1: Fall bordeaux, delayed dormant lime-sulphur 1-10, calyx lime-sulphur 1-40. Three sprays, 25 per cent fungus.

Exhibit L-2: Delayed dormant lime-sulphur 1-9, calyx lime-sulphur 1-35. Two sprays, 50 per cent fungus.

Average fungus Exhibit L, two and three sprays, 37½ per cent.

Exhibit M-1: Fall bordeaux, pink lime-sulphur 1-20. Two sprays, 50 per cent fungus.

Exhibit M-2: Fall bordeaux, pink lime-sulphur 1-10 part of orchard, other part bordeaux 4-6-50. Two sprays, 50 per cent fungus.

Average Exhibit M 50 per cent.

Exhibit N-1: Delayed dormant lime-sulphur 1-10, pink lime-sulphur 1-35, ten days bordeaux (two-thirds of orchard 5-5-50). Three sprays, 25 per cent fungus.

Exhibit N-2: Delayed dormant lime-sulphur 1-9, pink lime-sulphur 1-25. Two sprays, 30 per cent fungus.

Exhibit N-3: Fall bordeaux, delayed dormant lime-sulphur 1-15, pink lime-sulphur 1-30, ten days atomic sulphur 10 pounds-100 gallons. Four sprays, 90 per cent fungus.

Average fungus Exhibit N, two, three and four sprays, 48½ per cent.

Exhibit O-1: Calyx lime-sulphur 1-25. One spray, 75 per cent fungus.

Exhibit P-1: Delayed dormant, lime-sulphur 1-10. One spray, 90 per cent fungus.

It seems from a close study and analysis of Exhibits A to P that it may be helpful to the growers of Hood River valley to point out comparisons of these analyses showing the value of a certain number of sprays, and also to point out the loss from the omission of any one of the important sprays. Later on I will speak of the comparative value of different fungicides, as evidenced in these observations, and results.

Exhibit A gave the highest percentage, consisting of six sprays, fall bordeaux, delayed dormant lime-sulphur 1-9, semi-dormant, pink, calyx and ten days lime-sulphur 1-33, showing only 5 per cent fungus at thinning time, the cleanest crop, with one exception, so far as these results show, namely, Exhibit F-1, which I will analyze specifically later.

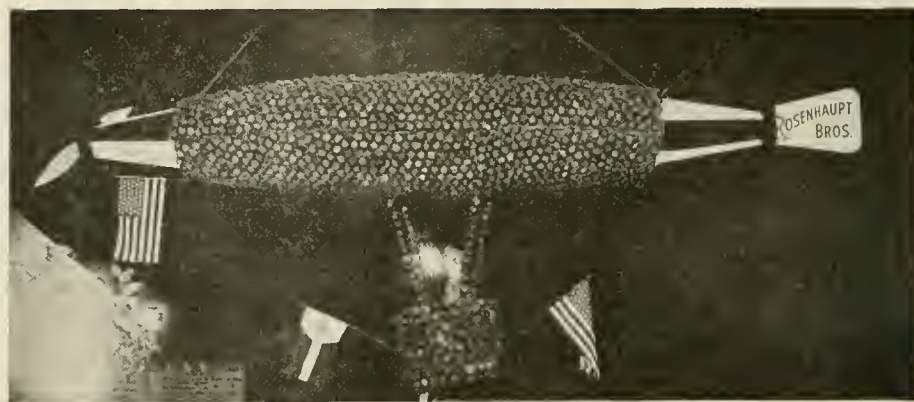
Exhibit B, consisting of five sprays, fall bordeaux, delayed dormant, pink calyx and ten days, 10 per cent fungus; the semi-dormant being omitted.

Exhibit C, four sprays, delayed dormant, pink, calyx and ten days, 5 per cent of fungus; fall bordeaux and semi-dormant omitted.

Exhibit D, five sprays, fall bordeaux, delayed dormant, pink, calyx and ten days, the semi-dormant omitted, fungus 17½ per cent. Attention is called to the increased fungus in Exhibit D, where five sprays were applied, as compared to Exhibit C, where four sprays were applied, that atomic sulphur was used in the calyx in Exhibit D.

Exhibit E, five sprays, fall bordeaux, delayed dormant, pink, calyx and ten days, 15 per cent fungus. Comparisons should be made with Exhibit C, four sprays, showing 5 per cent fungus; attention being called to the fact that in Exhibit E atomic sulphur was used in the pink and calyx.

Exhibit F, four sprays, fall bordeaux, pink, calyx and ten days, delayed dormant and semi-dormant being omitted, fungus 7½ per cent. Comparison should be made with Exhibit C, where five sprays were used, attention to the difference is called for the reason that in Exhibit F the grower applied an ex-



Winner of third prize among original and attractive displays. Baby Zeppelin made of apples, entered by Rosenhaupt Brothers of Mica, Washington. Ninth National Apple Show, Spokane, Washington, November 20-25, 1916.

remely early pink, using a large quantity of spray per tree, fungus showing only 5 per cent, thus decreasing the average per cent of fungus in Exhibit F seven below the normal average.

Exhibit G, three sprays, fall bordeaux, pink and calyx, 20 per cent fungus. Delayed, semi-dormant and ten days omitted.

Exhibit H, four sprays, fall bordeaux, delayed dormant, calyx and ten days, semi-dormant and pink omitted, fungus 26¼ per cent, showing heavy loss from omission of the pink application.

Exhibit I, three and four sprays, fall bordeaux, delayed dormant, pink and calyx (semi-dormant and ten days omitted), fungus 22½ per cent, showing loss by omission of ten days spray.

Exhibit J, two sprays, pink and calyx (fall bordeaux, delayed dormant, semi-dormant and ten days omitted), fungus 32½ per cent.

Exhibit K, three sprays, delayed dormant, calyx and ten days (omitted fall bordeaux, semi-dormant and pink), fungus 15 per cent. Attention is called particularly to the omission of pink spray.

Exhibit L, three sprays, fall bordeaux, delayed dormant and calyx (omitted semi-dormant, pink and ten days), fungus 37½ per cent.

Exhibit M, two sprays, fall bordeaux and pink (omitted delayed dormant, semi-dormant, calyx and ten days), fungus 50 per cent. Attention is called particularly to the omission of the calyx and ten days' sprays.

Exhibit N, two and three sprays, delayed dormant, pink and ten days (omitted fall bordeaux, semi-dormant and calyx). Attention is called particularly to the omission of calyx spray. Fungus 48½ per cent.

Exhibit O, one spray, calyx (all others omitted), fungus 75 per cent.

Exhibit P, one spray, delayed dormant (all others omitted), fungus 90 per cent.

From the preceding observations and statements in connection with the estimates of fungus in relation to the number of sprays applied and materials used, and the omission of certain sprays, it is evident to me, and I think will be clear to my fellow apple growers, that any omission of any of the important sprays means more scab. The following indicates the increasing

quantity of fungus in the various exhibits in accordance with the different spraying programs as already explained specifically in each individual case.

Exhibit A, 5 per cent.

Exhibit B, 10 per cent. Insufficient quantity of spray increases percentage in this exhibit.

Exhibit C, 5 per cent.

Exhibit D, 17½ per cent.

Exhibit E, 15 per cent.

Exhibit F, 7½ per cent.

[Note—Small percentage of Exhibit F due to using extremely early pink, as already stated in Exhibit F-1.]

Exhibit G, 20 per cent.

Exhibit H, 26¼ per cent.

Exhibit I, 22½ per cent.

Exhibit J, 32½ per cent.

Exhibit K, 15 per cent. [Note—Exceptional.]

Exhibit L, 37½ per cent.

Exhibit M, 50 per cent.

Exhibit N, 48½ per cent.

Exhibit O, 75 per cent.

Exhibit P, 90 per cent.

Conclusion: With the data already presented it seems that every grower should be able to plan a spraying schedule which, if applied at the right time and in the right way, will give a crop with an extremely small percentage of fungus. The evidence and results already given are especially convincing.

The cleanest crops were produced in 1915, where the greatest number of sprays were applied.

The omission of the pink or calyx sprays, or both of them, cause the most severe loss.

The use of lime-sulphur in the pink and calyx generally give better results and less fungus.

Bordeaux, in 1914 and 1915, applied in the pink or calyx have caused more or less damage by russetting, in some cases very severe.

It does not appear to be established, nor is it stated by pathologists, that bordeaux in the fall is an important factor in fungus control.

Bordeaux in the fall is a necessary protection in this valley for anthracnose.

As many growers think it has a fungicidal value when applied in the fall, it seems advisable to recommend its application, particularly on account of anthracnose.

Ninth National Apple Show, Spokane, Nov. 24-25, 1916

By Robert S. Phillips, Spokane, Washington

IN many ways the Ninth National Apple Show, held in Spokane, November 20 to 25, was the most successful in the history of that important Northwestern event. The attendance of actual growers was the greatest in the history of the show. They came from all parts of the Northwest, eager to exchange ideas regarding their problems, and ready to give the other fellow the benefit of their experiences and successes in attacking the problems with which they were most familiar.

It was interesting to note the change that has taken place in the big Spokane show during the nine years of its existence. At the outset and for several years the central idea of those behind the show was to assemble a great quantity of apples. The growers sent them in by the carload, and in the racks they covered acres of ground. It made an impressive sight, and served the purpose at that time, but in later years it was found that the expense of assembling this enormous quantity of apples was not justified. They found that the same results could be accomplished with fewer apples on exhibition, and this gave them the opportunity to devote the money and the efforts of their organization toward doing a number of things that have proved to be of very great benefit to the fruitgrowers of the Northwest. This developed the conference idea, which has grown year by year until in 1916 we had the biggest and most successful conference in the history of the show. The big assembly room on the sixth floor of the Chamber of Commerce Building was turned over to the growers. Here they got together five days, each morning and afternoon, and threshed out their problems. One of the big features of the conference was the presence and active participation of James Madison, general manager of the California Associated Raisin Company. Mr. Madison told how the raisin men had doubled their selling price and at the same time doubled their output in the last three years, and he advised application of the raisin men's plan to the apple industry. "Co-operation alone won't do the work," he said in a discussion of the situation. "You will have to have full control of the situation and a central authority. The growers must finance their own business. Of course, the merchants and bankers chipped in some, too. I was a gentleman farmer living in San Francisco. I met another raisin grower at the club one day and he said, 'What can we do to better our condition?' We discussed the matter for a while and I finally told him if he would give me a little money I would give three months of my time. Twenty-five men put up one hundred dollars apiece for stenographers, solicitors, etc. Here is the way I put it up to the growers: This is your company, not my company, but your company. We started in that we were to have \$750,000 subscribed in money and sufficient control of the acreage to control the product. Those two things are necessary for a successful co-operative movement. First have control of the product and then have the money to finance it. The farmers must put up the money to run their own business. I found when I started in 36,000 tons of raisins kicking around among the farmers and several thousand tons in the east. This was in April with another crop coming on in four months. I realized that we would be stuck with the fall market coming on unless we could do something to get rid of these raisins. We purchased 25,000 to 26,000 tons of the raisins in California and I bought all the raisins in New York I could get hold of. We sold them and made 16% besides paying all expenses. The raisins sold like hot cakes. Why? Because we were in control of the market. Remember, we started with 36,000 tons and we produced that year 54,000 tons, so that our company handled that year about 90,000 tons of raisins. The following year we handled 93,000 tons and in 1915 130,000 tons. Before our organization was formed, four years prior that the average crop was 78,000 tons, and out of that we had accumulated a margin of 36,000 tons, showing that there was something wrong. On the first day of October, after a crop of 130,000, this year we didn't have a raisin. Now how did we increase this consumption? Advertising and salesmanship. We looked up where the consumption was slight; then the biggest volume of consumption that I could see was with the bakeries. It is all right for the housewife to use raisins, but they don't compare with the bakeries. We induced the bakers to make raisin bread. We have spent about one million dollars in salesmanship and

local advertising. We have had seventy men on the road for a year. But the whole cost has been included in that half million dollars. However, in place of carrying over thirty thousand odd tons of raisins today we haven't got a raisin to sell from now until the first of next October. This year some of our raisins were damaged during the season, so that we realized that we would have some raisins not up to standard. We authorized our agents to take orders for these and in four days they sold 31,000 tons, worth over \$5,000,000 without a price because we did not want to name a price until we knew how badly the crop was damaged. When you can increase the consumption of a product like raisins, which is more or less limited in its use, I am satisfied that you can do the same with apples. As I was crossing in the ferry at San Francisco the other day I saw a man eating an apple. There are a hundred thousand people crossing in those ferries every day; if you could induce every man coming across to eat an apple think what it would mean."

"Of course it could," he said. "Then one man sitting in his office would control all the apples of the Northwest. You would be putting the prices on them then—not the other guy. Now you throw your apples on the market and the other fellow looks them over and tells you what he'll give, and you have to take it."

During the conferences the joint state commission on fruit marketing appointed by the governors of Washington, Oregon, Idaho and Montana held a public hearing with representative growers, shippers and others interested in the fruit-marketing problem in the



First prize winner in 100-box contest for shippers. Wagener entered by Arcadia Valley Fruit Growers' Association, advertising the "A" Brand. Ninth National Apple Show, Spokane, 1916.

Northwest. The commission tentatively arrived at the following conclusions:

"It is recognized that the fruit industry of the four Northwest states is in sore need of financial assistance from federal and state agencies to assist in a thorough organization of the fruitgrowers, and that the several states should work in hearty co-operation with the federal office of markets in perfecting the organization of growers. We suggest that the federal government be asked to give additional funds and that the several states be asked to appropriate money to bring about the necessary co-operation with the federal government.

"We further recognize that a substantial step toward the solution of the marketing problem in the box-apple industry of the Pacific Northwest will be made through the passage by the several legislatures of laws providing for official state standardization of grades and packages, with a state system of packing-house inspection and official certification for the protection of the grower, wholesaler, buyer and consumer."

On the final day of the conference the joint commission was instructed by the growers, in a short resolution, to work for uniform laws in the four states concerning apple diseases, grade and pack, and by another resolution to work for a system of state aid in marketing enterprises under state control.

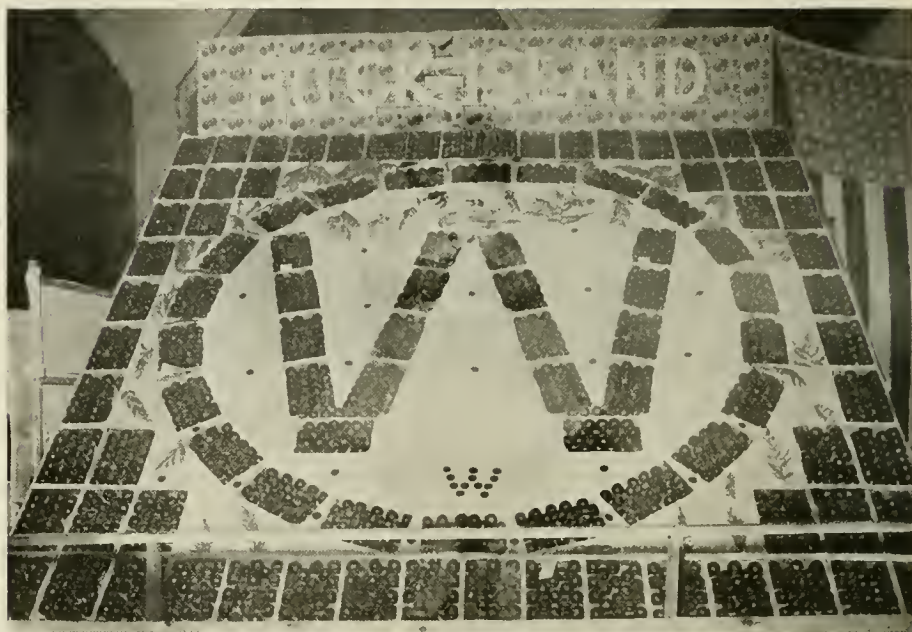
Extensive changes in Washington's apple-grading rules were made by the state grade and pack conference after an all-day battle between the rigid-rule advocates and the liberals. On most points the liberals won. The grade rules as finally adopted by the conference follow:

First Grade.—Grade No. 1, or "extra fancy" apples, are defined as sound, smooth, mature, clean, hand-picked, well-formed apples only, free from all insect pests, diseases, blemishes, bruises and other physical injuries, scald, scab, scale, dry or bitter rot, worms, worm stings, worm holes, spray burn, limb rub, visible water core, skin puncture or skin broken at stem; but slight russetting within the basin of the stem shall be allowed.

Second Grade.—Grade No. 2, or "fancy" apples, are defined as apples complying with the requirements for first-grade apples except that slight sun scald or other blemishes not more than skin deep shall be permitted up to a total of 10 per cent of the surface of the apple.

Third grade, or "C" grade apples, shall consist of apples free from infection but permitting two worm stings, and is shipped in closed packages shall be marked "Third Grade," or "C Grade."

The following minimum color requirements were specified for "extra fancy" and "fancy" apples, the figures indicating the percentage of "color" required in proportion to the total surface area of the apple:



Winner of second prize of \$50 in the 100-box contest. Entered by the Rock Island unit of North Central Washington Growers' League. This exhibit was made to advertise the Circle W brand. Ninth National Apple Show, Spokane, November 20-25, 1916.

SOLID RED VARIETIES.

	Extra Fancy Per cent	Fancy Per cent
Aiken Red	75	25
Arkansas Black	75	25
Baldwin	75	25
Black Ben Davis	75	25
Black Twig	50	15
Gano	75	25
King David	75	25
McIntosh Red	50	15
Spitzenburg (Esopus)	75	25
Vanderpool	75	25
Winesap	75	25

STRIPED OR PARTIAL RED VARIETIES.

	Extra Fancy Per cent	Fancy Per cent
Missouri Pippin	50	10
Jonathan	66 $\frac{2}{3}$	15
Stayman	66 $\frac{2}{3}$	15
Delicious	66 $\frac{2}{3}$	15
Ben Davis	50	10
Hubbardston	50	10
Jeniton	50	10
Northern Spy	50	10
Rainier	50	10
Snow	50	10
Wealthy	50	10
York Imperial	50	10
Wagener	50	10
Gravenstein	25	10
Jeffrey	25	10
King of Tompkins County	25	20
Kaigh Spitzenburg	50	10
Rome Beauty	50	No color

Under the heading "Red Cheeked or Blushed Varieties" were listed the Hyde's King, Maiden Blush, Red Cheek Pippin and Winter Banana, the requirements for "extra fancy" being "perceptible blushed cheek" and for "fancy" "tinge of color," except in the case of the Winter Banana fancy, for which no color requirement was made.

Under the heading "Yellow or Green Varieties" the following apples were grouped:

Grimes Golden, Yellow Newtown, Cox's Orange Pippin, Ortley, Rhode Island Greening, Northwestern Greening, Yellow Belleflower, White Winter Pearmain.

The only color requirement for these apples, in both "extra fancy" and "fancy" grades, is "characteristic color."

Another high light of the conference was a series of arguments, consuming

an entire afternoon, in favor of immediate elimination of unprofitable varieties of apples. The most exhaustive treatment of the subject was given by Franck E. Sickles, secretary of the North Pacific Fruit Distributors, who gave growers in detail the result of the study and experience of his organization.

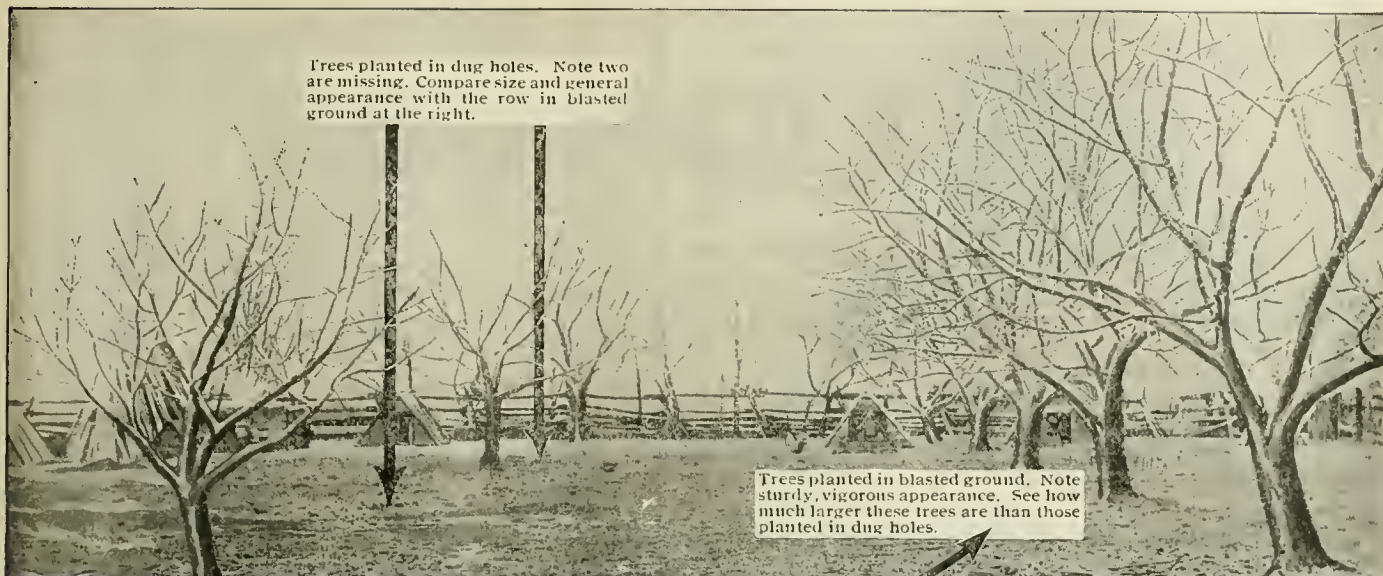
"Apples raised in the Northwest naturally fall into three classes," said Mr. Sickles. "First, those commercial varieties about which none of us probably will disagree. They are profitable varieties or else we have no such thing. I include in this class Arkansas Black, Delicious, Grimes Golden, Jonathans, Ortley, Rome Beauty, Spitzenberg, Winesap, Winter Banana, White Winter Pearmain, Yellow Newtown.

"The second class includes those varieties which are doubtful. I include in this class Aiken Red, Baldwin, Delaware Red, Gano or Black Ben, King David, Mammoth Black Twig, Missouri Pippin, Red Cheek Pippin, Stayman, Vanderpool, Wagener and York Imperial.

"Third class constitutes an innumerable number of varieties, of which small quantities are raised, including Apple of Commerce, Ben Hur, Bismark, Canada Red, Chicago, Champion, Fall Wine, Hoover, Hydes King, Ingram, Kaigh Spitz, Kentish, Kinnaird, Mann, N. W. Greening, Pewaukee, Rambo, Salamo, Shackelford, Walbridge and Willow Twig. The sooner the trees which bear this fruit are eliminated the better it will be for the industry and the growers of the Northwest."

The only section in which the last-named varieties ever can be marketed at a profit is the Northwest, Mr. Sickles said, adding that when sales have been made in this section they have filled at an unprofitable price a place which might have been filled at a profitable price with better varieties,

Continued on page 32



Trees set in blasted holes grow faster and yield better

EIGHTEEN years ago George W. Brown blasted the beds for ninety out of 100 apple trees that he planted. The trees set in dug-holes average 18 feet high, with a spread of 16 feet and a trunk girth of 27 inches. The other trees, in blasted beds, average 25 feet high, more than 25 feet in spread, and have a trunk girth of 42 inches. Plant *your* fruit trees in beds blasted with

GIANT FARM POWDERS

STUMPING — AGRICULTURAL

and *you* will find, as experiment stations have found, that "trees planted in blasted holes develop deeper and stronger root systems than trees planted in spade-dug holes," and will bear earlier and yield larger crops.

The Giant Farm Powders are made especially to suit *western* farm conditions. They pulverize the soil instead of packing it. They are used by hundreds of fruit growers for planting and deep-tilling their orchards. Ask your dealer for one of the Giant Farm Powders — Giant Stumping Powder or Eureka Stumping Powder, and for other Giant blasting supplies. Be sure to get the genuine, bearing the Giant brand. If your dealer has only ordinary dynamites, we shall see that you are supplied.

Free Book Coupon

THE GIANT POWDER CO., Con.
San Francisco.

Send me your illustrated books on the subjects which I have marked X:

- ☐ STUMP BLASTING
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- ☐ TREE PLANTING
- ☐ DITCH BLASTING

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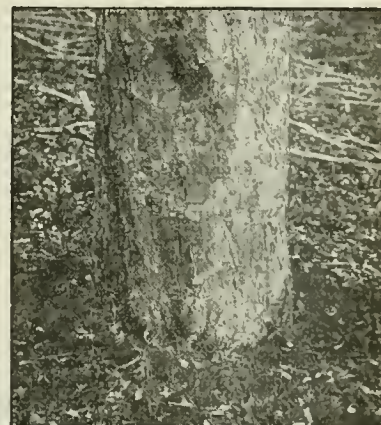
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Book, "Better Orchard Tillage," FREE

Every fruit grower will find valuable information in our illustrated book, "Better Orchard Tillage." It contains a complete analysis of how and why blasting soils increases growth and yields. It also tells how to do the blasting. We'll send you a copy free—mark and mail the coupon. Other books, on stump blasting, boulder blasting, subsoiling and ditching, also free on request.



Trunk of tree planted in blasted bed. Hardpan broken up, giving roots ample room for development.



Trunk of tree planted in same soil, without blasting. Note how hardpan has forced roots to surface and observe effect of lack of food.

THE GIANT POWDER CO., Con., Home Office: SAN FRANCISCO
"EVERYTHING FOR BLASTING"

Branch Offices: SEATTLE, SPOKANE, PORTLAND, SALT LAKE CITY, DENVER



Thanksgiving

*That our service has been
one of pleasure to our-
selves and satisfaction to
our many patrons is cause
for mutual thanksgiving.*



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Dust Spraying

Address Delivered by F. A. Frazier Before State Horticultural Society,
Hood River, Oregon, December 11-13, 1916

THE subject of Dust Spraying has been under consideration and trial for several years by one of the leading experiment stations in the country, namely, the Experiment Station of Cornell University. This experimental work was brought to a successful con-

clusion with the closing of the season of 1915. The season of 1916 marked the first general use of this method in New York State and in other fruit sections of the East. The results, on the whole, have been decidedly in favor of the dusting method.

In the use of lime and sulphur solution, it early became apparent to the owner of an orchard of any consequence that he was losing out in his efforts to control scab. This was not because lime and sulphur in itself had failed, but because of conditions which often prevented its application at critical times. And it is because of these conditions that Cornell undertook to work out some means whereby the New York orchards could be protected by something which permitted a quicker application. The dusting method is the result of that investigation and of succeeding years of trial and demonstration. The importance of this you may appreciate, for it was only last year that you of Hood River could not get into your own orchards and apply the liquid spray which was necessary, and the result was an almost total loss of your crop. This had occurred before and it may occur again. It also occurs in the control of codling moth when a spray must be applied within a limited time in order to insure protection.

Several districts in the Northwest had an example of this failure a year ago. At that time many blamed the sprays used, but we all know the blame was not on the arsenate of lead, but in the failure to apply it within the critical time. It was found that the apparent failure of the dusting method, as practiced several years ago, was attributable to coarse and improperly prepared materials, and to inefficient blowers. When finer sulphur was used a greater degree of success resulted; and when a sulphur powder was produced, the larger part of which would pass through a 200-mesh screen, the results approximated the best results obtainable by the use of lime-sulphur solution. With the success in the use of the finely-powdered sulphur against apple scab came the use of combinations with powdered arsenate of lead for the control of the codling moth, and the record is that the poison applied in this way has given better results at a far less cost than have ever been accomplished with liquid sprays. The combination of sulphur with arsenate of lead in the proportion of 85% sulphur and 15% arsenate of lead powder has met with favor. Then, in addition to this, came the use of a finely-powdered tobacco dust, containing a considerable per cent of nicotine, which supplies the requirements which have been met by nicotine sulphate, which is used in the control of aphids and other insects. Thus we have an all-around combination for summer spray in the dust form.

Now, I am not presenting this dust proposition as a cure-all, nor as one that obviates the necessity of intelligent use or thorough application. These are just as essential in the use of dust as with liquid spray, but there are two big advantages standing out prominently in the use of dust,—one, the time element, or the quickness of application; for one can do with the dust in one day as much as can be done in from five to seven days with the liquid spray; and within this time element is

Continued on page 30

FRUIT-FOG

The Scientifically Atomized
SUPER-SPRAY
produced by
HAYES SPRAYERS

SPRAYING that merely "drenches" your trees is *not enough!* A "super-spray" is absolutely necessary to insure sound, profitable fruit.

Most of the appalling annual fruit loss is caused by *hidden pests*. These cannot be reached with coarse, low-pressure sprays.

FRUIT-FOG—finest form of Super-Spray—produced by Hayes Power Sprayers *from any standard solution—will prevent this loss!* Thousands of orchardists know it.

HAYES Hand and Power SPRAYERS

FRUIT-FOG is like a fog or mist. Its amazing results are due to its remarkable fineness and adhering properties—not to **FORCE!**

Fruit-Fog gives far greater capacity with the same size nozzle; saves time and decreases expense. Will not knock off leaves or flowers like heavy, coarse, low-pressure sprays.

FRUIT-FOG envelopes everything with a vapory fog of solution; filters into tiniest crevices in bark; gets under bud scales; beneath fleshy stamens of apple blossoms; reaches both top and bottom of leaves; roots out *hidden pests* that no heavy spray can reach! Perfect control is certain.

FRUIT-FOG deposits a light film of solution—enough to quickly exterminate all diseases and pests *without injury to the tree*. Being vapory no drops form and run off. This means a big saving.

Fruit-Fog requires only a small amount of solution. A season's saving in solution cost alone will amaze you!

GUARANTEED!

capacities. Each part has been especially built for constant operation at high pressure and many years of service.

We make **50 Styles** of large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, painting, farm, home and garden use. Complete equipment or separate spray pumps, hose, nozzles, fittings, bamboo-roads, etc.

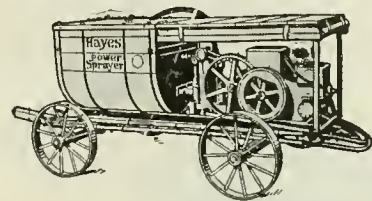
HAYES HAND SPRAYERS are built to give maximum pressure and capacity with minimum power to operate.

HAYES POWER SPRAYERS are tested to 500 pounds pressure and **GUARANTEED** to maintain 300 pounds working pressure at full rated

FREE SPRAYING GUIDE

Gives valuable information about spraying—tells when and how to spray, what solution to use for different pests. We will include an interesting story of **FRUIT-FOG** and complete 64-page catalog. Check and mail coupon at once.

A Few of Our 50 Styles OF Hayes Sprayers

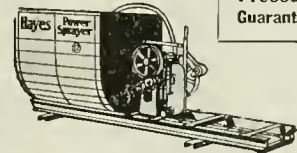


Large Power Sprayer

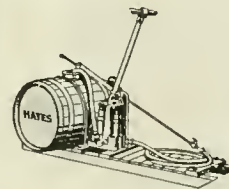
300 Lbs.
Pressure
Guaranteed



Small
Hand Sprayer



Outfits Less Engine



Large Hand Sprayer



Barrel Sprayer



Nozzles and Fittings

**MAIL
THIS
COUPON**

Complete line shown in
our 64-page catalog

Hayes Pump & Planter Company, Dept. K, Galva, Illinois
Please send Free Spraying Guide, book on **FRUIT-FOG** and 64-page catalog. I am interested in item checked.

☐ Hand Sprayers ☐ Power Sprayers ☐ Nozzles and Fittings

Name _____

Address _____

Hayes Pump & Planter Co.

Dept. K, GALVA, ILLINOIS

MYERS SPRAY PUMPS



Nature and weather conditions being reasonably kind to fruit trees and blossoms next spring and summer, there will be more fruit grown during 1917 than ever before. Markets will be good, prices will be right, but the fruit must be right also, for the demand will be for first quality fruit only and this is the only kind you can afford to grow.

It will therefore pay to take better care of your trees than ever before, and help them produce full crops of perfect fruit. Spray the MYERS WAY with a MYERS SPRAY PUMP—Small, Medium or Large Capacity—and be surer of your crops by giving them the very best of protection. Where extensive orchards or vineyards are to be sprayed we recommend the new MYERS AUTOMATIC POWERSPRAY PUMPS and OUTFITS, as being economical and the most efficient of any on the market. For spraying smaller orchards, shrubbery, gardens, etc.; for disinfecting, painting or whitewashing—for general use, Myers Easy Operating COG GEAR BUCKET and BARREL OUTFITS are unexcelled—Every Myers Spray Pump, Hand or Power, is tested, proven and guaranteed.

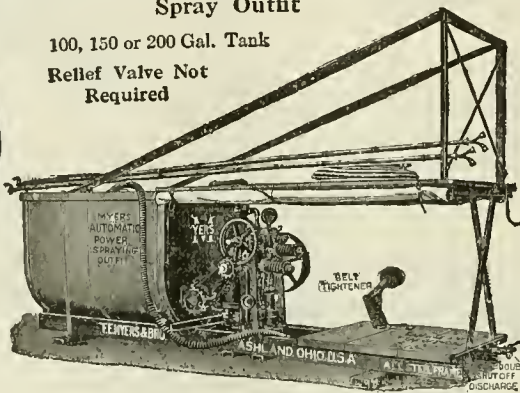
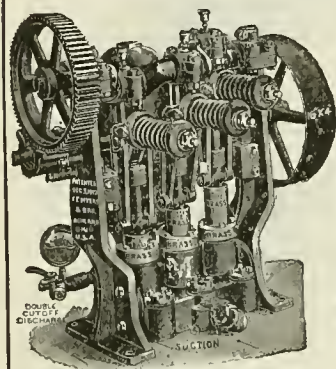
Catalog showing complete line, with valuable spraying information, mailed promptly to anyone interested in fruit growing.

Myers Automatic Triplex Spray Outfit

Large Capacity—and be surer of your crops by giving them the very best of protection. Where extensive orchards or vineyards are to be sprayed we recommend the new MYERS AUTOMATIC POWERSPRAY PUMPS and OUTFITS, as being economical and the most efficient of any on the market. For spraying smaller orchards, shrubbery, gardens, etc.; for disinfecting, painting or whitewashing—for general use, Myers Easy Operating COG GEAR BUCKET and BARREL OUTFITS are unexcelled—Every Myers Spray Pump, Hand or Power, is tested, proven and guaranteed.

Catalog showing complete line, with valuable spraying information, mailed promptly to anyone interested in fruit growing.

100, 150 or 200 Gal. Tank
Relief Valve Not
Required



F. E. MYERS & BRO., NO. 120 ORANGE ST. Ashland, Ohio

Codling Moth Investigations for 1915

By E. Leroy Childs, Experiment Station, Hood River, Oregon

[Editor's Note.—The Editor desires to call attention to the fact that these experiments and recommendations apply to the codling moth control as it exists in Hood River Valley, where the codling moth is an easier pest to control on account of the cool climate than it is in some of the fruit sections of the Northwest where the climate is exceedingly hot during the summer months. While the codling moth has been controlled by the Editor with three sprays, the Editor does not wish to have anyone understand that it is his opinion that three sprays for codling moth will give results, either in Hood River or in other fruit sections. Where the first brood of codling moth is extremely bad, many districts have found it advisable to follow the calyx spray with another in ten days or two weeks. When the second brood is particularly bad some growers in some districts have found it necessary to use, in addition to this, two sprays for second brood, and where there is a third or partial third brood another spray later in the season just a short time before harvesting. In fact, it seems to be the opinion of growers in the various districts, according to climatic conditions, the seriousness of the pest, etc., that all the way from three to five sprays will be necessary. More will be said about spraying for codling moth in future editions of "Better Fruit," in advance of the period for spraying for codling moth.]

THROUGHOUT the entire Northwest the codling moth infestation was very severe during 1915, and the loss to fruitgrowers in many sections was very heavy. The Hood River Valley,

as a whole, was much more fortunate in this respect than some of the other well-known apple-growing sections. In some orchards, however, where careless methods of application and timing of the arsenate sprays were practiced the losses incurred, due to the worms, reached a total of as high as 50 per cent of the crop.

The loss from this source in the valley during 1915 was about twice that of 1914, and unless more thorough spraying is done during the coming season there is every reason to suppose that the losses will be even greater. In many orchards hibernating larvae are very plentiful, and with favorable weather conditions these will produce a prolific first brood of worms next spring with their attending serious fruit

injury, unless poison is liberally used.

Owing to the fact that there was little time available to devote to a thorough study of the codling moth during 1915, a complete report relative to this insect is not possible at this time. Our investigations carried on during the past season have brought to light, however, several interesting points which should prove of value to the fruitgrowers.

In outlining the experiments it seemed advisable to determine at least the three following points: 1. Does arsenate of lead lose its efficiency when used in combination with one or more fungicides employed in controlling our two most widespread diseases, scab and mildew. 2. Will the "three-spray" schedule control the codling moth in orchards seriously infested. 3. Is the calyx spray (debated by many Hood River growers) essential in effecting satisfactory control.

Inquiries often come to the station relative to the advisability of mixing arsenate of lead with the fungicides that are used in controlling apple diseases. In our investigations during the past season we have used arsenate of lead in combination with lime-sulphur and iron sulphide; lime-sulphur and atomic sulphur; lime-sulphur and barium tetra-sulphide and with milled sulphur and bordeaux mixture. In no case was the efficiency of the poison decreased.

Injury from spray burning to the fruit and foliage was observed in some of the experiments, especially where the first application had been delayed until the foliage growth was well advanced. In one of the experiments the first application, lime-sulphur 1-35, iron sulphide 2-100 and arsenate of lead 5-100 was not applied until the second of June. The foliage on the trees in this experiment, especially on the southeast side was badly burned. The fruit drop was very heavy on all of the sprayed trees. Unfortunately but one check was left—this tree held its fruit. The results, though not conclusive, indicate that later spraying with this combination is at least dangerous after the first of June. In an adjoining experiment where this same combination had been used in the calyx application ten days later, and then the characteristic lime-sulphur burn.

During the past season several experiments were carried on to determine if it were possible to eliminate some of the earlier codling moth sprays in badly infested orchards and still obtain effective control of the first generation of worms. The following combinations were tried out: First, calyx application only; second, calyx, "10-day" later and the "30-day" application; third, calyx and "30-day" application; fourth, "30-day" only. The crosses in the accompanying table indicate the combination used.

EXPERIMENTS TO DETERMINE SPRAYS NECESSARY FOR CODLING MOTH CONTROL.

	First: Calyx. May 5	Second: "10-day" June 2	Third: "30- day." June 2	Fourth: Summer application. Aug. 10	Fruit counted	Per cent wormy	Calyx en- trance	Side en- trance
Experiment 1	×	×	×	×	776	10.8	3	73
Experiment 2	×	×	×	×	1008	.8	8	8
Experiment 3	×	×	×	×	997	9.7	27	70
Experiment 4	×	×	×	×	430	39.4	53	116
Check	×	×	×	×				

Continued on page 33

Bean Double Giant

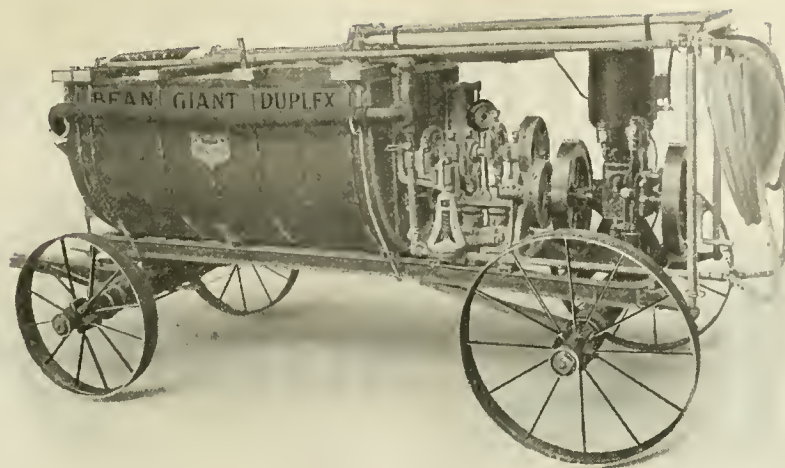
Capacity 25 gallons per minute, 400 lbs. pressure. Supplies 10 or 12 lines of hose.

Bean Giant Triplex

Capacity 8½ to 11½ gallons per minute, 200-250 lbs. pressure. Supplies 2 to 4 lines of hose.

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Bean Little Giant Duplex

Capacity 5 gallons per minute, 200 lbs. pressure. Supplies 2 lines of hose.

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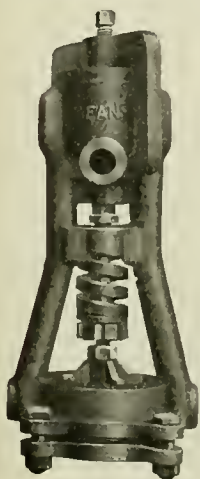
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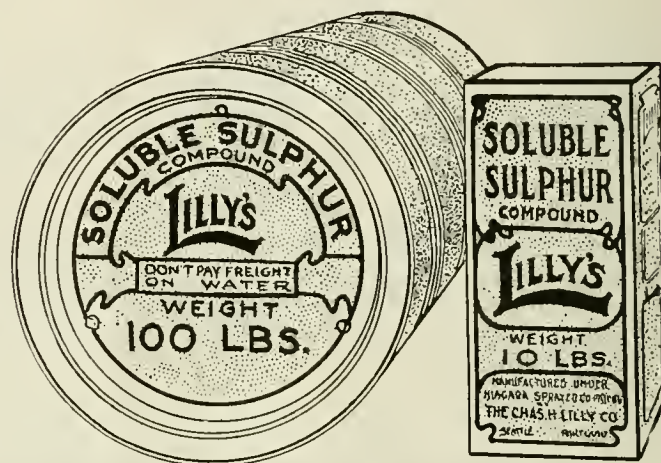
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Influence of Pruning On Fruit-Spur System of Apple

By V. R. Gardner, Oregon Agricultural College, Corvallis—Read Before Meeting of Oregon State Horticultural Society, Hood River, December, 1916

IN presenting this subject, it is my desire to be as brief and to the point as possible. I shall attempt to include no more detail than seems absolutely necessary to a discussion of the fruiting habits of the apple and of some of the more evident relations of certain pruning practices to these fruiting habits. If we are to understand how to prune so as best to develop the fruiting habits of our trees, it is desirable that we should keep clearly in mind an ideal toward which we should work. The ideal fruit tree is one that bears regularly large quantities of high-grade fruit and at a reasonably low cost per unit of production. How may proper pruning aid in realizing this ideal? What are the pruning practices that help or hinder in attaining it, and why do they help or hinder?

Let us first consider the fruiting habits of the apple. Flowers appear in the spring from buds produced the season before. Not all the winter buds, however, unfold and produce flowers.

Some give rise to new-shoot growth only. It is often possible to tell from inspection during the fall or winter which buds are to give rise in the spring to flowers and fruit and which to new shoots. If we study the fruiting branches of the apple somewhat closely, we will note that in the case of many varieties (e. g. Spitzenberg, Grimes, etc.) flower buds are to be found only upon short woody branches, lateral to the main direction of growth. Such short woody branches we call spurs. In the case of young trees of certain other varieties (e. g. Rome, Gano, etc.) they are to be found for the most part laterally upon the shoots of the past season; though, generally, as trees of these varieties become older they gradually come to bear upon spurs. At first thought it may seem to be a point of little significance that young trees of certain varieties produce their fruit buds, and consequently their fruit, upon shoots instead of spurs, or upon spurs instead of shoots. However, it will be seen to be a matter of considerable importance, especially with varieties that bear only upon spurs, when it is realized that certain pruning practices result in practically eliminating the fruit-spur system from the trees. Other pruning practices that tend greatly to develop the fruit-spur system and to correspondingly check shoot

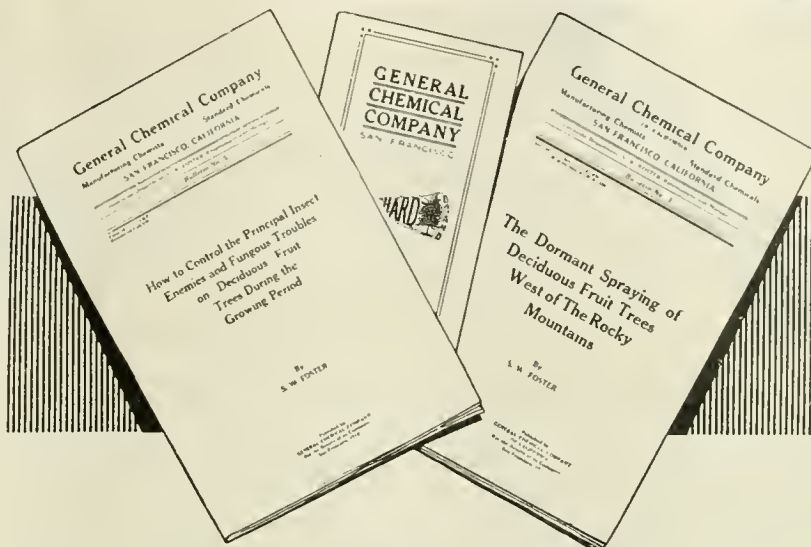
growth may be almost equally harmful for young trees of varieties that at that time bear mainly upon shoots. From these statements it becomes evident that one of the first things the owner of a young orchard should do is to determine by which method the variety or varieties he is growing bears the bulk of its fruit. Since the larger part of our apple varieties produce the bulk of their early crops upon fruit spurs, and since practically all varieties bear their later crops in this manner, this article will concern itself with the way in which fruit-spur formation and fruit-spur functioning is influenced by various pruning practices. This is far from stating that the influence of pruning practices upon the formation of lateral buds upon shoots is not important. It is an important question for the owner of a young Rome or Gano orchard to consider, but time will prevent its discussion here.

If good fruit spurs are so vital to the bearing of satisfactory crops, it becomes evident that pruning and cultural practices should be such as will tend to develop and maintain an extensive and efficient fruit-spur system. Let us first inquire as to when and where fruit spurs arise. Do they develop on the new growth, on the growth of the past season, or from older wood? Do they develop more

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readily upon shoots in certain portions of the tree than upon shoots in other portions—and if so, why? Are they more prone to develop from certain portions than from certain other portions of the same shoot? These are not merely academic questions, for the results that we obtain from our pruning practices very largely depend upon their answers. Fortunately we are not without answers to some of them. Careful examination will show that practically all spurs starting to develop any one season start out from shoot growth of the season before. A few develop from shoot growth of the current season, i. e. from the new wood, but the number developing in this way is comparatively small. Very rarely do we find spurs developing from wood older than the past season's growth. Just why this is true it might be difficult fully to answer, but the fact remains that it is only in exceptional cases that buds that were formed during, say, the season of 1910 develop into spurs later than 1911. That is if spurs do not start to develop from them in 1911 we cannot expect to obtain spurs from them in later years. They may grow out into shoots in later years, under the stimulus of very heavy, pruning, heavy fertilization, etc., but they are not apt to develop into fruit spurs. This fact should carry an important lesson for the fruitgrower, for it means that if he is to have fruit spurs in the lower and interior part of his tree he must develop them when the tree is young, when that part of the tree is year-old growth. If the interior part of the tree is prevented from developing fruit spurs by too severe pruning, or if spurs once formed there are broken or pruned off, it is practically impossible to develop them there again, except indirectly upon new sucker or shoot growth that may be encouraged. The fruitgrower should come to look upon the shoot growth of his trees as material that is capable of yielding fruit spurs directly only for a year. If it does not furnish him fruit spurs within that period it loses its value as fruit-producing wood and is useful simply as a support for newer wood that may produce fruit.

From what has been said one would infer that the question of whether or not the lateral buds of a shoot are, or are not, to develop into spurs is more or less under the grower's control. This is actually the case. Examination of the buds along an average apple shoot will disclose the fact that some are very small and poorly developed. They look as though they may have been poorly nourished. Others are large and plump, giving evidence of being strong and vigorous. If such a shoot is observed as growth starts in the spring, it will be noted that usually it is only the large plump buds that push out and form new shoots and spurs. Should the small weak buds "break" under the stimulus of heavy pruning, it is generally shoot growth rather than spurs that develop from them; and if they "break" and form spurs, and spurs are weak and soon die out or cease to grow. In other words,



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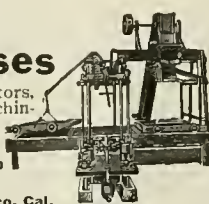
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it is only the strong, vigorous buds on shoots that are apt to make strong, vigorous fruit spurs. Close observation in the orchard will reveal the further fact that it is those portions of the shoot that are most exposed to the sunlight—namely, the upper and outer portions—that develop strong, large lateral buds. It naturally follows that it is from these portions of the shoot that most of the fruit spurs may be expected to develop; and, as a matter of fact, do develop.

With these points in mind let us see how several of the more common pruning practices modify or control the formation of fruit spurs. First let us consider the influence of winter heading back of the shoot growth of the past season—a practice constituting well over fifty per cent of the pruning afforded our orchard trees. The immediate result is to remove the terminal one-half or one-third of the shoot—the one-half or one-third that has most of the large, vigorous lateral buds possessed by the entire shoot and that normally would grow out into fruit spurs. This leaves few buds from which spurs may be expected to develop, and this means that the major part of the energies of the tree will be expended in the development of new shoots from the smaller and weaker lateral buds that are left. Such shoots, coming as they do from adjacent joints or nodes, come into close competition for light and air, crowd each other, and grow out and up toward the light. This in turn forces the formation of the large plump buds that are to give rise to the fruit spurs of another season far up or out on the shoots, where the light supply is a little more abundant. Heading back these new shoots the following winter again removes a large percentage of the buds that otherwise might develop into fruit spurs and stimulates the formation of another crop of shoots that again crowd each other, and with the same general results. Heavy heading back then tends to reduce greatly the number of new fruit spurs—(1) through the removal of buds that would normally grow out into spurs; (2) through forcing into shoot growth the weak buds toward the base of the shoots; (3) through leading to the greater crowding of the new shoots and thus weakening their lower buds and pushing out still further (terminally) the area of the new shoot that develops strong spur-producing buds. It requires little study to see that a moderate or a light heading back, while operating in the same general direction, exerts a correspondingly less powerful check upon fruit-spur formation.

Thinning out of shoots during the dormant season, on the other hand, has an effect upon fruit-spur formation almost opposite from that of heading back. It is true that thinning out removes a number of the large well-developed lateral buds that otherwise might form fruit spurs; but the proportion is not so great as in the case of a heading back that is equally severe, because most of such buds are located

Continued on page 20

There's Money in the J. H. Hale Peach Where Others Have Shown No Profit



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carry a thousand miles farther than Elberta, and I can see that the picking season can easily be extended about ten days in advance of Elberta, and as much later."—Roland Morrill, Benton Harbor, Michigan.

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SUBSCRIPTION PRICE:

In the United States, \$1.00 per year in advance

Canada and foreign, including postage, \$1.50

ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

THE EXPERIMENT STATION OF THE OREGON AGRICULTURAL COL- LEGE, CORVALLIS, OREGON.

The work of the Experiment Station and its results have a bearing upon the prosperity of the state, which is little understood by most members of the Legislature for the reason that the majority of legislators are lawyers, business men and professional men, only a small number being farmers and fruit growers. The work of the Experiment Station has to do almost entirely with farming, stock raising and fruit growing and products of the soil, of which business and professional men have very little knowledge of, consequently they are inclined to look on the Oregon Agricultural College and Experiment Station as purely an educational institution, failing to realize that the Experiment Station is a big factor in contributing to the success of the farmer, fruit grower, the stock raiser, dairyman or poultry man. The Experiment Station has scientifically trained men for studying all diseases of stock and poultry, issuing bulletins on the treatments of the same, as well as the care of stock. They are conducting experiments for the purpose of ascertaining what varieties of seeds are best suited to climates and soils in the different sections of the state. In fruit growing the Experiment Station is conducting experiments for the purpose of ascertaining how to control the different pests and eradicate the different diseases, which all kinds of fruits are subject to. There are many diseases and problems to be worked out in connection with these different phases of farming, fruit growing and stock raising that may not be solved in two years, and may require several years.

The Editor of "Better Fruit," being a fruit grower of thirteen years' experience in Hood River Valley, feels he can speak more intelligently upon the value of Experiment Stations to the fruit

grower than to the general farmer. On the other hand, there are many general farmers who could explain the value of the Experiment Station to the farming industry or stock industry far more effectively than the Editor of "Better Fruit." However, it remains a fact that the Experiment Station at Corvallis has conducted a number of experiments and developed methods for controlling diseases and pests or increasing yields that have added hundreds of thousands, perhaps millions, of dollars to the State of Oregon, which in a general way has contributed to the general prosperity of the state, in addition creating hundreds of thousands of dollars more business in the way of farm and fruit products that cannot be covered in a short editorial. The benefits derived by the farmers and fruit growers are so many it would take a full page in "Better Fruit" to cover this subject in a partial way. However, it is hoped one or two illustrations may be sufficient to prove the value of Experiment Stations, at least to the fruit industry.

The apple crop of the State of Oregon is estimated at four or five million dollars for 1916. If it had not been for the information furnished by Experiment Stations through bulletins on spraying for San Jose scale there would not be an apple tree or fruit tree left today in the State of Oregon. If it had not been for the bulletins, demonstrations and instructions given on spraying for codling moth the apple crop of the State of Oregon, worth \$5,000,000 in 1916, would not be worth 50 cents, because it would have been absolutely eaten up by the worms.

In all sections of the State of Oregon, except Eastern Oregon, there is a disease of apple trees known as anthracnose. This disease got a start in the State of Oregon a few years ago, making rapid havoc of the orchards. It was not known how to control it. A process of control and eradication was worked out by Dean Cordley. A practical demonstration was made in the orchard of Eisman Bros., Grants Pass, after the disease had got a good start. The Editor saw this orchard after it had been saved, loaded with a crop worth several thousand dollars. Since that time anthracnose has developed in a number of other sections throughout the state, which have all been saved by the method of treatment worked out by Dean Cordley of the Oregon Experiment Station. This method is generally used for the control of anthracnose throughout the entire world today. There is another disease known as fungus, more commonly called scab, which attacks apples, particularly in humid climates. Up to a few years ago the general method of treatment was bordeaux, which prevented the apples from being scabby, but under rainy conditions caused them to be so russeted they were unmarketable. Again the Oregon Agricultural College shines out as a savior of the fruit industry, as Dean Cordley, through several years of experiment work, developed a treatment of lime and sulphur which protected fruit from fungus, without injuring the fruit. The apple crop in

Hood River Valley alone will amount to over \$1,500,000 for the year 1916, all of which was sprayed under the direction given by the Experiment Station, being practically free from fungus. Without the method of treatment discovered and worked out and recommended by the Experiment Station through Dean Cordley and his assistants, the apple crop of Hood River on account of scab would have very little, if any, market value.

When an Experiment Station starts in to work out a process for the control of diseases, it can be readily understood that they cannot tell how long it will take. It may take two years; it may take four or six years; therefore the Experiment Station needs a continuous appropriation for the purpose of completing what they have started to work out. Without a continuous appropriation they cannot undertake to work out and complete experiments within the limit of the present appropriation of two years. On account of the excellent work that has been done by the Experiment Station in the State of Oregon, the editor feels justified in recommending in a most emphatic way possible that the Experiment Station of Oregon is entitled to adequate appropriation and continuous appropriation. The editor of "Better Fruit," in behalf of the fruit industry of the State of Oregon, worth many millions of dollars, believes that the Experiment Station is entitled to the fullest support of the Legislature. It is the earnest request of "Better Fruit," in behalf of the fruit-growers, that every member of the Legislature take sufficient time to investigate for himself the work being done by the Experiment Station, and if not posted on what is being done to inquire of someone who is familiar with what is being done and what the Experiment Station is expected to do. Without the scientific knowledge in possession of the fruitgrowers at the present time obtained through the Experiment Station the crop of fruit in the State of Oregon amounting to \$9,000,000 this year, in all probability would not be worth marketing. The Legislature cannot afford to ignore or pass up any adequate appropriation for an institution like the Oregon Agricultural College and Experiment Station.

Spraying.—In 1915 the growers suffered a very severe loss by inefficient spraying. By inefficient spraying is meant poor workmanship, lack of necessary applications, poor material, omission of applications at the right time, too weak strengths, etc. The serious loss of 1915 was an object lesson, consequently in 1916 the growers seemed awakened to the situation, doing pretty generally a first-class job in proper shape, the result being a clean crop with very little fungus, and very few stings. A clean crop cannot be obtained if any spray on the program is omitted. Having obtained clean crops in 1916 the growers should profit and remember that it is thorough work that gets results and spray accordingly in 1917. In 1915 growers varied in fungus all the way from 5 per cent to as high as 90 per cent. In 1916 very few exceeded 5

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per cent of fungus. But it must be remembered that in 1916 the growers used four times as much fungicides as in 1915. In 1915 in some districts the per cent of loss from codling moth ran as high as 25 to 30 per cent. In 1916 the loss from codling moth was comparatively small. Growers should not omit any spray for codling moth. In some districts clean crops can be obtained on three sprays under normal conditions. In some districts five sprays show the best results. Generally speaking, a spray, including the cost of material (one material) and labor, will cost about one cent per box per time, with a good fair average yield. The grower cannot afford to risk from ten to fifty per cent of his crop by omitting any one spray which only cost one cent per box. While there is good sense in the statement that a spray of moderate strength, thoroughly applied, will pro-

duce better results than a stronger solution inefficiently applied, growers should be careful in their idea of economy and be sure that the solution has sufficient strength to control. In this connection the editor desires to call attention to the fact that there are many scientists who recommend arsenate of lead at two pounds to a hundred; some advise three pounds to a hundred; manufacturers usually advise four pounds to a hundred. In 1904 Dr. E. D. Ball, then Director of the Experiment Station at Logan, Utah, now at Madison, Wisconsin, gave to the fruit-growers the most interesting data on spraying for codling moth that had appeared up to that time, stating that where less than five pounds to the hundred gallons was used the codling moth damage exceeded by far the saving in the cost of material. The editor has constantly followed this program ever since, producing crops about as free from codling moth as any grower. This year the editor again used five pounds to one hundred gallons in his sprays. The number of stings being so small that it was impossible to figure it in percentage. To give some idea of how free from stings the editor's crop was, one of his pickers picked two days, which would mean 100 boxes, only finding one sting. The editor of "Better Fruit" is a strong believer in five pounds of arsenate of lead to the hundred. However, he is willing to admit that under certain conditions some growers may be able to secure satisfactory results with less. The

editor is not giving advice, because every man must decide what spray material to use and the strength to apply. The editor gives you his opinion and the results obtained for such consideration as you see fit to give it.

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Last season LATIMER'S DRY made its introductory bow to the apple growers of the Northwest and met with instant success in every district where it was used.

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Influence of Pruning, Etc.

Continued from page 16

on the terminal portion of the shoot. If these strong, potentially spur-producing buds were evenly distributed between the basal and terminal half of each and every shoot, it is evident that a 50-per-cent thinning would remove exactly as many as a 50-per-cent heading back; but on the other hand, that if all such buds were located on the terminal half of each shoot the heading back would remove them all, while the thinning out would remove only half of them. These are extreme cases, but they at least serve to illustrate the general tendency of the two practices so far as concerns the removal of spur-forming buds. Furthermore, there is an equally great contrast between the results that follow thinning as compared with heading in the influence of the two practices upon the location, or distribution, of such buds upon the new shoots. Just as heading back tends to increase the amount of new shoot-growth, concentrate it in a smaller area, lead to crowding and thus through shading to a pushing out toward the end of the shoot the area that produces large plump spur-producing buds; so thinning out tends to decrease relatively the amount of new shoot growth, distribute it over a larger area, avoid crowding and thus, through providing better light conditions for the basal portions of the shoots, lengthen the area that produces spur-producing buds and bring it closer to the base of the shoot. Naturally the effects of light or moderate thinning out upon fruit-spur formation may be expected to be less pronounced than those following heavy thinning.

From the statements that have just been made, it might be inferred that because we desire a large number of fruit spurs in the apple tree and because the tendency of winter thinning is to encourage their formation while that of winter heading is to check or reduce it, thinning out is the only pruning practice to be recommended and heading back is in all cases to be avoided. Even though such recommendations were made few practical fruitgrowers would be inclined to follow them, at least without some modification, for they know that constant thinning out coupled with no heading back eventually would result in the development of loose, straggling trees—trees weak mechanically, even though they might possess sufficient spurs for large crops of fruit. Is there not some way, then, of keeping the apple tree fairly compact and still not invite the evils attendant upon the severe winter heading back that is practiced so commonly? Investigations of the Oregon Experiment Station extending over a number of years lead to our recommending a certain type of summer pruning to obviate this difficulty. It has been found that an early summer pruning (about July 1) of young apple trees is followed by a secondary late summer-shoot growth that functionally closely corresponds with the terminal half or third of shoots on trees that are not summer pruned. That is, this late

summer secondary shoot growth normally produces large, plump lateral buds that the following season are prone to grow out into fruit spurs. Furthermore, this late summer shoot growth of summer-pruned trees is generally advantageously placed in the tree, and it is not apt to be so long that much heading back is required during the following dormant season. The result is that the tree under this pruning treatment rapidly develops a fruit-spur system because this secondary shoot growth becomes covered with fruit spurs the year following its production. At the same time there is no tendency for the tree to become straggling in form. It is a method of procedure enabling the preservation of all the good effects resulting from thinning, for there is a vigorous thinning both at the time of summer and of winter pruning, and the avoiding of the evil effects of heading back, because the heading back is done at a time of the year when it does not remove the portion of the shoot that is most prone to develop fruit spurs. This latter combination, then, is the pruning treatment that we recommend for the quick development of a vigorous and extensive fruit-spur system in young trees of varieties that normally bear upon spurs from the start. It will be understood that it is not a pruning treatment recommended for varieties that at first normally bear mainly upon shoots. It will be understood, also, that it is not a pruning treatment that is recommended for older trees that have been bearing good crops for a number of years and necessarily have already developed an extensive fruit-spur system. With them the object should be to keep their old spurs strong, vigorous and productive rather than to promote the formation of a great many new ones. Pruning treatment that will best promote that object will be discussed later. Before leaving this subject it may be well to call attention to the fact that the proper timing of this summer pruning is an important matter. It should be given comparatively early in the growing season. If delayed until there are signs of terminal-bud formation in the main shoots, little or no secondary shoot growth will be produced. On the other hand, if done too early in the growing season equally unsatisfactory results are apt to follow. The best time seems to be when shoots of the current season have obtained one-half to two-thirds of their normal length. The exact time will vary with variety, location, season and many environmental factors.

The statement was made that the ideal fruit-spur system is not only an extensive system, but a productive system. At first thought it might seem that productiveness is correlated with age. However, recent investigations have shown that old spurs are neither more nor less efficient than young spurs on account of their age, for many old spurs are regular producers of high-grade fruit. On the average they are less efficient, but less efficient because less vigorous. What, then, are the factors influencing the productiveness of the

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individual fruit spur. A careful study during the growing season of the fruit-spur system of almost any old apple tree reveals the fact that it is in the more densely shaded portions that we find the majority of the weak and dying spurs. Light supply is undoubtedly not the only factor influencing the vigor of individual fruit spurs, but it is plain that it is an important one. The influence of heading back and of thinning out upon light supply, and consequently upon spur formation from buds on the basal portions of shoots has already been pointed out. It is evident that these two practices would lead to equal, or even greater, differences in the light supply reaching already established spurs in the lower and interior portions of the tree.

Therefore, we would expect more vigorous,—because better lighted,—spurs in the tree receiving much thinning; and this would be true whether the thinning is limited to the new shoots or is extended to the older wood. On the other hand, we would expect weaker spurs in trees receiving much heading back, even though at first thought it might seem that this practice would tend to divert a certain amount of food material into the spurs lower down in the tree. It should be remembered, however, that it is elaborated food materials, such as are received from well-developed leaves, rather than raw food material, such as are received from the roots, that induce fruit-bud formation and fruiting; and heading back would have more of a tendency to divert raw,

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rather than elaborated food materials into the spurs. That our expectations in this matter square with the facts is evident to one who will go to the orchard and carefully compare the fruit spurs of severely thinned with those of severely headed trees. Thinning out, then, would seem to be a practice that not only encourages the formation and development of an extensive fruit-spur system in the apple, but that operates to keep that system in a strong, vigorous and thrifty condition. In this connection it may be worthy of note that these results may probably be expected to follow summer as well as winter thinning. On the other hand, heading back during the dormant season would seem to be a practice that not only checks fruit-spur production, but tends to weaken and devitalize already established spurs. From this it is evident that thinning out should come to occupy a more prominent and heading back a less prominent place in the pruning of both young and old apple trees.

This is far from stating that apple trees just coming into bearing or that have been bearing for a number of years, should not be headed back. As stated before, summer heading back may well have a place in the development of the young tree, especially when coupled with both summer and winter thinning out. Furthermore, it is often desirable to head back the limbs in old trees so as to force out new shoots lower in the tree—shoots upon which new spurs may be developed to replace those in the older portions of the tree that have been destroyed through one agency or another. As a matter of practice it will generally be found that the average tree requires a certain amount of thinning out and a certain amount of heading back in order to develop the most efficient fruit-spur system. Just how much of each type or kind of pruning to give in each case cannot be told any article on the subject. These are questions that must be settled for each tree at the time of pruning, but they are questions that should not be settled in haphazard fashion. The correct answer to them depends first upon accurate judgment regarding the tree's condition and its needs and then in a sound knowledge of how distinct pruning practices will modify those conditions and meet those needs. It would seem to the writer that this series of questions should flash through the mind of the pruner before he prunes any apple trees: (1) Does this tree at this age bear mainly upon spurs or upon lateral buds or shoots? (2) If it bears upon spurs, are there enough or too few or too many? How severe and what kind of pruning will just maintain, increase or decrease their number? (3) Are the older spurs becoming weak and dying out? (4) How severe and what kind of pruning will invigorate them? (5) How can I maintain the desired shape of tree without injuring the fruit-spur system? Let these questions be seriously considered and there will be made fewer expensive mistakes in the pruning of our fruit trees.

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The Fruit Growers' Agency, Inc.

By Paul H. Weyrauch, President.

THE Agency was organized on March 26, 1916, with a membership representing approximately ten thousand ears of apples and other fruits grown in the four Northwestern States.

The general plan was suggested by representatives of the Office of Markets after a thorough investigation of the conditions existing in the Northwestern States. Activities have been carried on with the purpose of bringing about co-operation among the numerous selling agencies in the solution of problems common to the industry.

The Office of Markets has played an important part in the work of organization and also in the work of the Agency. Our chief activities may be summarized as follows:

1. The securing of reliable information as to crop conditions.
2. The establishment of a reliable market news service in conjunction with and with the assistance of the Office of Markets.
3. Providing for uniform methods in the harvesting, grading, packing and physical handling of fruit.
4. The standardization of account sales so as to establish a feeling of confidence between grower and shipper.
5. Working toward improvements in transportation service and storage.

In conjunction with state officials two crop estimates were issued. The first estimate was published on July 3, 1916, and a revised estimate was given out on September 1, 1916. These estimates were prepared with great care and the actual number of cars shipped to date would seem to indicate the approximate accuracy of the estimates.

A market news service was established in the office of the Agency at Walla Walla early in August to report upon soft-fruit shipments. This service was of especial value in the movement of the prune crop. This service was in charge of a representative of the Office of Markets. About September 15th the Market News Service was transferred to Spokane in order to enable the office to more easily reach the various fruit centers. The Spokane office was opened by representatives of the Market News Division of the Office of Markets. Two daily reports were published. The first report was of a general nature, giving information concerning crop movement, telegraphic information from different markets of the East and South as to market conditions and quotations. This report was sent to anyone interested in it. A second report was sent out, being confined to shipping members of the Agency and to those non-members who agreed to contribute the information necessary to make up the report. This report furnished a tabulated statement of orders booked, giving variety, grade and price, also destination; shipments on previously booked orders, and movement of cars rolling, with information as to rollers sold.

The matter of providing for uniform methods in the harvesting, grading,

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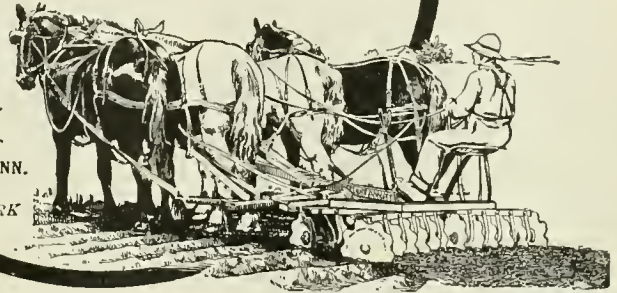
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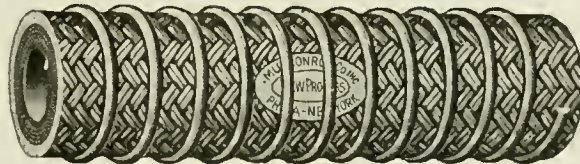
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packing and physical handling of fruit is now in the hands of a very competent committee, and the next season will see the inauguration of some of the plans that are now being worked out. Here again the Office of Markets has been of great assistance, and two of its experts have made a thorough survey of conditions. As a result a temporary inspection service was established at

Fort Worth and Dallas, where cars are now being inspected and reported upon.

The importance of keeping accurate records and accounts has not in the past received the attention to which it is entitled, and a great amount of work has been done within the Agency to secure recognition for this most important and indispensable branch of any industry. A Committee on Account-

Insecticide Tonic Fungicide

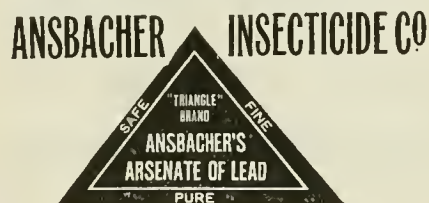
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G. I. Aiken, Placerville, Cal., writes:

"I have Winesap trees that for the last ten years have been so Scabby that I was thinking seriously of digging them out. However I decided to try once more, this time using your "Adheso" and the result was that I had over 99 per cent clean fruit."

Mr. Aiken has re-ordered.

The Wonderful Apple Crop of W. D. Shoupe, written about in the Nov. 15th issue of *The Fruit Grower* was sprayed with 1800 lbs. of "Adheso". Mr. Shoupe has ordered 1800 lbs. for 1917 for his Sandoval, Ill., orchard. The Largest Apple Crop Ever Grown By a Single Grower Was Sprayed with our "Triangle" Brand Arsenate of Lead. John W. Miller, Martinsburg, W. Va., grew this year 45000 bbls., valued at \$150,000. All Sprayed With Our Sprays. Mr. Miller has placed his entire order with us for 1917.



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An orchard of 17 acres, 10 acres in bearing; 4 acres trees two to five years; balance in alfalfa.

Located at Cashmere, Washington, a section noted for splendid quality, with a record for high prices. 1917 crop estimated 4,000 boxes apples, 250 boxes pears.

Pleasantly situated bordering on the Wenatchee River. First class water right (Jones-Shotwell ditch). All enclosed pipe pressure gravity system. Fine well of water for household purposes.

A good tenant is wanted on one-year lease, with understanding lease will be extended if mutually agreeable. The tenant must be a man willing to work, with practical experience in apples, who will take excellent care of the place. Above all, tenant must be reliable, with good common sense.

References required. For further particulars address "Cashmere," care "Better Fruit."

ing and Business Practice, working in conjunction with a representative of the Office of Markets, has investigated and made a study of the system of accounting in thirty-seven shipping organizations located in the Northwestern States. A uniform account sales has been devised, which is now being used in twenty organizations who are all members of the Agency. A system of accounting for fruit-shipping associations has also been devised and installed in seven organizations for experimental operation. A study is being made of the cost of packing house and warehouse operation, also of questions of financing, pooling, grouping of sizes and office and warehouse procedure in general.

A number of important transportation problems have also had the attention of the Agency. The following may be mentioned as some of the matters taken up:

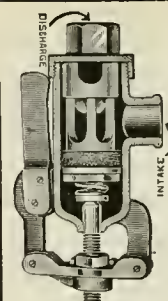
1. Diversion privileges to Canadian points for Northwestern fruit. This privilege has been granted by railroads interested.
2. Adjustment of diversion charges.
3. Storage-in-transit privileges into certain Eastern points.
4. Precooling and original icing by shippers.
5. Transportation rates on ocean freight.
6. Adjustment of rates into South-eastern territory. These rates have already been published by the interested carriers in response to our request.

Through the activities of the Agency the state governments of the four Northwestern States have also been interested and the governors of these states have appointed a joint commission to work in conjunction with the Agency in matters pertaining to the fruit industry. This commission has recently held several meetings and has passed the following resolution:

"After holding public hearings for two days with representative growers, shippers and others interested in the fruit-marketing problem in the States of Washington, Oregon, Idaho and Montana, the Joint State Commission of Fruit Marketing, appointed by the governors of the several states, has tentatively arrived at the following conclusions:

"It is recognized by the commission that the fruit industry of the four Northwest States is in sore need of financial assistance from federal and state agencies to assist in a thorough organization of the fruitgrowers, and that the several states should work in hearty co-operation with the Federal Office of Markets in perfecting the organization of growers. We suggest that the federal government be asked to give additional funds and that the several states be asked to appropriate money to bring about the necessary co-operation with the federal government.

"We further recognize that a substantial step toward the solution of the marketing problem in the box-apple industry of the Pacific Northwest will be made through the passage by the



King of Relief Valves "THE BINKS"

Not until we were positively sure that this Valve would meet all conditions did we advertise or offer it for sale. After three years of the most vigorous tests by ourselves and experiment stations it has proven a remarkable success. Positively guaranteed to operate with the regularity of a watch, blow off within 5 pounds of set pressure and give entire satisfaction.

THE STAR BRASS WORKS

319 N. Albany Ave., Chicago, Ill. Dept. E.

Pear and Cherry Trees

We offer exceptionally fine stock at rock-bottom prices. Also a full line of other choice nursery stock at bargain prices.

Write today. We have only a few trees left.

BENEDICT NURSERY CO.

185 E. 87th St. No.

Portland, Oregon

GOOD SEEDS

Ten of the Finest Vegetables

For 25c We will mail one large packet each of the following Vegetables in a coupon envelope. This coupon will be good for 25c worth of seeds selected from our Catalogue on any other order for 75c worth of seeds.

Bradley's Earliest Radish; crisp and brittle.
Bradley's Early Egyptian Turnip Beet; blood red.
Bradley's Earliest of All Lettuce; very crisp.
Bradley's Imp. Early Jersey Wakefield Cabbage.
Bradley's Earliest of All Blood Red Tomato.
Bradley's Best Extra Early Sweet Corn; delicious.
Bradley's Perfection Long White Spine Cucumber.
Bradley's Mammoth Yellow Prizetaker Onion.
N. Y. Improved Spineless Egg Plant.
Improved Mammoth Ruby King Sweet Pepper.

25c buys all the above and in addition we will send one large packet "SPENCER SWEET PEAS," a mixture of 10 varieties; regular price 15c.

Big Illustrated Catalogue FREE.

ILLINOIS SEED AND NURSERY CO.

104 Main St., Makanda, Illinois

The First National Bank

HOOD RIVER, OREGON

A. D. MOE - - President

E. O. BLANCHARD - Cashier

Capital and Surplus \$125,000
Assets Over \$500,000

Member Federal Reserve System

several legislatures of laws providing for official state standardization of grades and packages, with a state system of packing-house inspection and official certification for the protection

of the grower, wholesale buyer and consumer."

The Agency has been organized less than nine months and its total expenditures to date are slightly more than five thousand dollars. Within the short time available and with the limited funds at hand it has been the means of bringing into closer co-operation the more important factors in the fruit industry of the Northwest. Its work has been of great value in the dissemination of crop information, in the establishment of a reliable market news service, in its work toward securing better accounting systems, and in its activities in the adjustment of transportation problems.

The program of the Agency must appeal to everyone interested in the industry, be he grower, shipper or receiver. Under its supervision and guidance all legitimate factors in the industry will be properly protected, and it should receive the support of everyone who has the real interest of the fruit industry at heart.

My Experience in Land Clearing

By Thomas Cunningham, Farm Manager
for the Western Fuel Company.

IT is my intention in this article to deal particularly with the actual work of land clearing. Much has been said and written on the subject, and still land clearing remains an arduous task. To get down to hard facts: There is on each acre of land a given quantity of wood to extract from the ground and burn. There is also a given quantity of soil to handle in grading and leveling the ground to make it suitable for farm implements to do their work on. All this work requires power to accom-

plish, whether it be machine power, horse power, manual labor or explosive powders. We cannot get away from these facts.

Stumping may be divided into five distinct methods: By burning in the ground, destroying by chemicals, digging out by manual labor, by blasting and then burning or by pulling the stumps and then burning.

Pulling and Blasting Methods Combined.—In an experience gained by clearing some four hundred acres of land I have come to the conclusion that a combination of the two last named methods is the only practical way to clear land. That is to say: Pull out the smaller stumps whole, then blast the larger stumps and pull out the remaining portions, if any, and burn.

Hand-Power Stump Pullers.—Very recently I gave a demonstration on stump pulling to the members of the Royal Commission on Agriculture, appointed by the government of British Columbia. In this demonstration I attached a hand-power stump puller to a fir stump about 20 inches in diameter. This stump was on an open gravelly soil, and the roots penetrated quite deep. I pulled it out quite easily in seven and one-half minutes, the roots being pulled out clean and clear. While pulling the stump (as is my usual custom) I kept a man with a mattock knocking the dirt from the roots as the stump was raised and allowing it to fall back into the hole made by lifting of the stump. By doing this the ground is left nearly level and requires very little grading afterward. Naturally, the members of the commission were greatly delighted with the machine, and in order to personally test it Mr. Hayward, M. P. P., chairman of the commission, and Mr. Shannon, one of the members, took hold of the lever and pulled out a stump themselves.

The main points of advantage to the farmers about these machines are: Their low cost places them within the reach of all; their cost of operation is small, as they can be operated by one, two or three men, as desired;

the cost for repairs is practically nothing; their light weight allows of their being easily and quickly moved from one point to another; there is no heavy hauling back of cable, thus making changes from one stump to another very quickly; the slow-traveling movement of the pulling cable allows time for the roots to worm themselves clear of the soil, thus making a clean extraction of all roots; they will pull as large or larger stumps than any of the makes of horse-power or steam-power devices, and the high-speed gear will pull small stumps very fast.

Briefly speaking, the method I find most satisfactory in land clearing is to first clear off all underbrush or second growth. Next remove all valuable logs and dispose of them. Then pile and burn all valueless logs. Next pull out whole all stumps up to about 20 or 22 inches diameter, always keeping a man knocking the soil off the roots as the stump is being pulled. Then blast the larger stumps and pull out any remaining roots. Then pile and burn and the land is ready for rock picking and plowing.

SEASON'S GREETINGS

"Better Fruit" has received a number of Season's Greetings, which have been unusually attractive, typographically and artistically, as well as beautiful in sentiment, indicating a feeling of prosperity and good will for Christmas 1916 and New Years 1917. "Better Fruit" desires to acknowledge the receipt of these many remembrances and feels especially pleased and complimented in being honored this way by the largest institutions in the United States. Those received to date are as follows:

The Hudson Motor Car Company, Detroit, Michigan, sends out a large folder, beautifully and artistically done, very handsome in appearance, reminding one of the excellent qualities of the Hudson Super-Six.

Cherry Trees

Fruit and Ornamental Trees, Shrubs, Vines, etc. Free Catalog. Agents Wanted. Special Terms.

MILTON NURSERY COMPANY
MILTON, OREGON

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The H. & M. Lime-Sulphur Machine

FOR THE INDIVIDUAL ORCHARD

As far ahead of the old kettle and the steam-barrel method as the power sprayer is ahead of the old hand pump. Absolutely no hand stirring or other disagreeable work in using this machine. One unskilled man can make 20 barrels of high test concentrated solution every working day. No mechanic needed, nor chemist; any boy can run it. Cheaply installed in a floor space of 4x6 feet. With the H. & M. Machine you can cut your own spraying expense from ONE-HALF to TWO-THIRDS and can also make a big profit in supplying your neighbors with Lime-Sulphur Solution.

INVESTIGATE NOW

HART-MASSEY CO., Winchester, Virginia

FRUIT TREE STOCKS

AMERICAN GROWN—Apples, Japan and Kieffer Pear Seedlings. **IMPORTED**—Pear, Plum and Cherry Seedlings, Quince and Rose Stocks. **GRAFTS**—Apple and Pear, any style. **LARGE ASSORTMENT**—Fruit Trees, Small Fruits, Ornamental Trees and Shrubbery, Roses, Vines, etc.

Write for
Prices

SHENANDOAH NURSERIES

**D. S. LAKE, PRESIDENT
SHENANDOAH, IOWA**



Indoor Closet

More Comfortable, Healthful, Convenient

Eliminates the out-door privy, open vault and cess-pool, which are breeding places for germs. Have a warm, sanitary, odorless toilet right in your house. No going out in cold weather. A boon to invalids. Endorsed by State Boards of Health.

ABSOLUTELY ODORLESS

Put It Anywhere In The House
The germs are killed by a chemical process in water in the container, which you empty once a month. Absolutely no odor. No more trouble to empty than ashes. Closet absolutely guaranteed. Write for full description and price.

ROWE SANITARY MFG CO. 1123A ROWE BLDG., DETROIT, MICH.
Ask about the Ro-San Washstand—Hot and Cold Running Water Without Plumbing

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of

Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

Clean Coast Grown Seedlings

Oregon Champion Gooseberries and

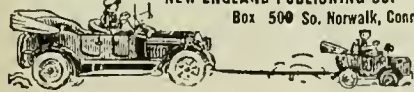
Write Now Perfection Currants Write Now

New Ford Joke Book 1917

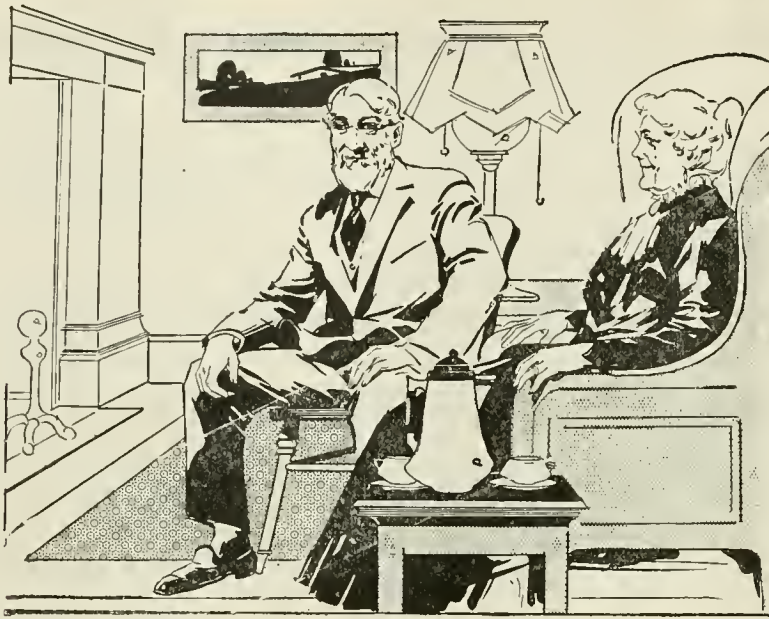
All the latest jokes on the Ford Auto. Hundreds of them and all good ones. Spring a new one on your neighbors. Large book with colored cover by mail, 10c

NEW ENGLAND PUBLISHING CO.

Box 500 So. Norwalk, Conn



WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



"John, I haven't missed my cup of Ghirardelli's Ground Chocolate for forty years."

Ghirardelli's Ground Chocolate

*is used in more than a million
homes in the West.*

It comes **PROTECTED**—as all chocolate
should—in $\frac{1}{2}$ -lb., 1-lb., and 3-lb. hermet-
ically sealed cans.



Since 1852

D. GHIRARDELLI CO.

San Francisco

"All kinds" of power



Because it's a re-
fined gasoline—not
a mixture.

**STANDARD OIL
COMPANY**
(California)

The Blalock Fruit and Produce Company, Captain Paul H. Weyrauch president, Walla Walla, Washington, has a very attractive folder in the form of a Christmas tree, over which is printed the Season's Greetings and thanks for business favors in the past.

The H. K. McCann Company, New York and San Francisco, have an unusually large folder, printed on heavy paper, which is very artistic and handsome and extremely original, being a winter scene with the rooftops covered with snow. A roadway is pictured along which is a procession of people bringing in all the good things to eat and drink that bring good cheer, like venison, casks of rare wine, etc.

E. I. du Pont de Nemours Company, Wilmington, Delaware, have issued a very elegantly engraved card conveying New Years Greetings from the president, Mr. Pierre S. du Pont.

Hicks-Chatten Engraving Company, Portland, Oregon, have a very attractive Christmas folder, beautifully done in rich colors of red and gold, with a snow scene, surrounded by a soft background of pearl gray.

The Union Pacific System have an attractive card of Good Will and Good Cheer Greetings for a Merry Christmas and Happy New Year, with the Union Pacific shield decorated in holly.

The Union Meat Company, Portland, Oregon, have issued an engraved card that is beautiful in simplicity, wishing a Merrie Christmas and Happy New Year.

Mr. John B. Cancelmo, Philadelphia, is the first firm issuing a calendar to be received at this office for 1917. In past years "Better Fruit" has received many calendars, which usually come along about the first of the year, but none surpasses this in elegance. It consists of a head of an Indian Princess in relief, in bronze and gold effect, the colors being very rich. The calendar is conspicuous for its elegance and richness and at the same time simplicity.

The California Chemical Company, Watsonville, California, have issued a very magnificent and attractive calendar especially designed for office use, particularly for a large office, with a very handsome picture in colors, the whole calendar being 28x40 inches.

The Pacific Paper Company, Portland, have an attractive small folder, handsomely engraved with an attractive monogram in red on the cover page, with the Christmas and New Years Greetings inside.

The Sprague Canning and Machinery Company, of Chicago, have a handsome engraved card with the "sign of quality" at the top, beautifully engraved in Old English, conveying Christmas Greetings.

The United Lithograph and Printing Company, of Rochester, New York, have a small but very attractive card, decorated in holly.

The Yakima County Horticultural Union, North Yakima, have issued a neat and very attractive card with Christmas Greetings, signed by Mr. Fred Eberle, general manager.

The Novo Engine Company, Lansing, Michigan, has issued an attractive Christmas card, beautifully printed, with a green border, with 1917 in embossed gold letters.

The Produce Reporter Company, Chicago, have issued a very attractive Season's Greeting, artistically decorated with an attractive holly wreath.

Mr. A. C. Rulofson, San Francisco, representing the Pittsburgh Steel Company and the Twisted Wire and Steel Company, sends out a beautifully engraved folder, full of Christmas Good Cheer, expressing high appreciation of old friendships, beautifully engraved and decorated in colors, rendered more attractive by one of the old fashioned Christmas candles and a very handsome picture in colors of a moonlight snow scene.

**Farmers' Week Programs—January
22-27, 1917.**

The general topics for the daily programs of Farmers' Week will be as follows:

Monday—Horticulture; special attention to problems of potato production.

Tuesday—Farm Crops and Soils.

Wednesday—Poultry.

Thursday—Dairying.

Friday—Livestock with special emphasis on sheep husbandry.

Saturday—"Home Curing of Meat" and "Legume Inoculation," lectures and demonstrations.

Detailed programs will be sent upon request.

Investigation on Spraying for Woolly Aphis 1916

By E. Leroy Childs, Experiment Station, Hood River

[Editor's Note.—Attention is called to the fact that these series of experiments refer to Hood River conditions. In other districts other methods may be found satisfactory. Therefore it is the Editor's suggestion that fruit growers in each district, where they do not understand how to control woolly aphis, should consult with their experiment station or other reliable horticultural experts, who have had experience in controlling woolly aphis and the knowledge of how to do it founded on success.]

WOOLLY APHIS infestations have been rapidly increasing during the last two years in many orchards in the Hood River Valley. This fact makes experimental control work advisable in order that the most advantageous method of control may be determined. Though an old enemy of the apple, and an insect upon which much experimental work has been done, there are many obscure points relative to its life-history and control which demand solution before entirely satisfactory control measures may be developed.

From the preliminary observations made during the past fall we found the insects pass the winter, for the most part, hibernating as nymphs or young insects. On severely infested trees, countless thousands of the small mite-like aphids will be found under the old bark scales of the trunk and larger limbs. They are also found in large numbers in protected places on the smaller limbs and twigs, especially on twigs which bore a severe infestation during the past year.

Any good contact insecticide will kill these young aphids if it hits them, but owing to their secretive habits it becomes necessary to use a material which will work into these places of protection. Oil applications possess greater penetrating qualities than other contact sprays, and they are therefore recommended for this purpose. Of the oils that may be used, a standard miscible oil is suggested. This material will readily mix with water and the great loss of time that occurs when using crude materials is avoided. Crude-oil emulsion can be used, but often growers will experience considerable difficulty in preparing a complete emulsion. Oil, if not properly emulsified, is liable to injure the trees.

In our preliminary experimental work we have found that the addition of soap tends to increase the penetration and spreading qualities of the oil. The following formula is suggested for use in combating the woolly aphis: Miscible oil, 4 or 5 gallons; whale-oil soap, 2 to 3 pounds; water, 100 gallons. If leaf-roller is present in the orchard, increase the oil to six gallons.

Pruning the orchard before spraying is attempted is found to lessen the work to a large extent. In so doing many of the out-of-the-way twigs and branches which are infested with the insects are removed. These twigs are the ones that are usually slighted when spraying and, if removed, the chances of an immediate reinfestation of the sprayed trees is materially reduced.



4 Big Secrets of Successful Fruit Growing

The four bed-rock foundation Secrets of Fruit Fortune are now set down, for the first time, in Stark Bro's brand-new idea in Fruit Books. You can learn these four big secrets **FREE** by sending your name and address on a post card. Send today. Take advantage of the opportunity NOW to get this library of fruit learning—4-colors, just off the press—to find out exactly how orchardists have grown rich—how they get \$12 a barrel for apples—\$2.70 a crate for peaches—how they made money from spare land. Send for this definite, systematic knowledge on how you can make fruit growing pay big, today.

J. H. Hale Peach Trees, 10c

Special offer to readers of Better Fruit. STARK BRO'S handsome, well-rooted 2-foot trees, packed and delivered F.O.B. Louisiana, Mo., at 10c each.

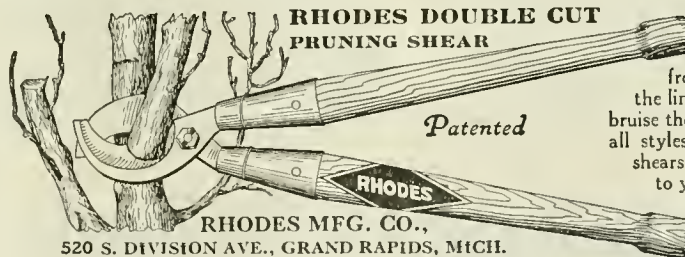
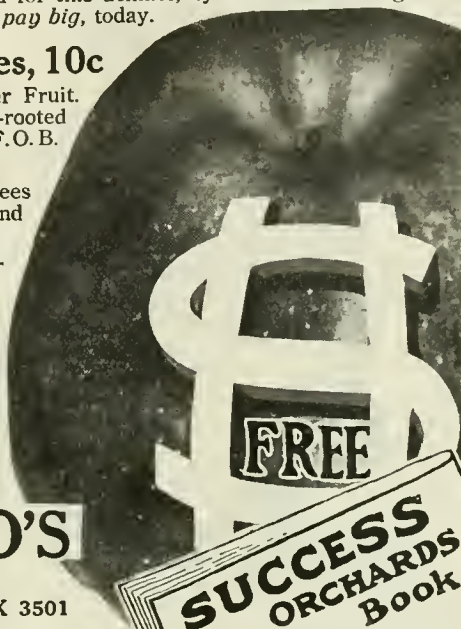
This special offer good only when trees are purchased in bundles of ten, and this ad is sent with order.

FREE FREIGHT to you brings our famous nurseries as near to you as your railway station.

The new book also tells you how to get **FREE Landscaping Plans** drawn by experts to your order, and describes Ornaments which will increase your property value in dollars as well as in livableness. Send for this Fruit Book and Catalogue with its hundreds of life-size photos, rich natural color plates. We'll gladly send it **FREE**. Write NOW.

STARK BRO'S

Remember the name of the town
LOUISIANA, MO. BOX 3501



RHODES MFG. CO.,
520 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door.

Write for circular and prices.



Have your harness dipped

Let your harness dealer dip it occasionally in Eureka Harness Oil. Quickly done, costs little, but adds years to the life of your harness. It pays.

EUREKA Harness Oil

protects the leather from sweat, moisture and dirt by filling the pores with preservative oils. Ask your dealer today.

Standard Oil Company
(California)



The Power Behind the Spray

must be ample, steady and unfailing. It must drive the mixture through long pipes and small nozzles into a perfect mist.

Novo Engines have been standard equipment on leading sprayers long enough to prove that rough ground, hill-side angles and hard usage don't cut into their performance.

NOVO ENGINES AND OUTFITS

Other evidence of Novo Reliability is their adoption by pump makers and by manufacturers of concrete mixers and other power machinery.

You do not buy a power sprayer very often. Why not have on it the handiest, steadiest, most economical source of reliable power, the Novo Engine? Write us for names of reliable manufacturers who equip their machines with Novo Engines.

When you buy a spray rig, insist on Novo Power.

NOVO ENGINE CO.
 Clarence E. Bement, Sec. & Gen. Mgr.
 730 Willow St., Lansing, Mich.
 Furnished to operate on gasoline, kerosene, alcohol or distillate.

Finest Peach Farm in Ohio

186 acres, 10,000 trees; picked 15,000 bushels last year; 11,000 gallons fuel oil and 1,500 heaters for smudging next year. 300 feet above surrounding country; air drainage on three sides. Best location in Southern Ohio orchard district. One-third cash.

C. A. THOMAS & CO., COLUMBUS, OHIO

FERTILE FARM LAND

In Virginia, N. Carolina, West Virginia and Ohio at \$15 per acre and up offer big values for the price. Best climate, markets, schools, and transportation facilities—Good land and good neighbors. You can't locate in a better section. Write for further information and attractive literature telling all about it—

F. H. LaBaume, Agr'l & Ind'l Agent
 288 Norfolk & Western Ry. Bldg., Roanoke, Va.

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
 IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly

SEND FOR BOOKLET

Arcadia Orchards Company
 Deer Park, Washington

On account of the fact that large numbers of the insects occur under the bark scales on the trunks, it is necessary thoroughly to drench this portion of the trees. Hold the nozzle close and apply with a good pressure. Scraping away the old bark scales before making the application, will aid in exposing the aphids. This practice will not only aid in destroying the woolly aphids, but will help to rid the orchard of codling moth.

A Promising Tractor and a Great Harrow

One of the most interesting sights of the great Fremont (Nebraska) Tractor Demonstration was the "latest edition" of the "little Henry" Tractor. While this little tractor is not yet ready to go upon the market it performed nobly at the demonstration.

This double-action engine harrow has 24 18-inch disks and cuts 6½ feet wide, harrowing the soil twice at a single operation. It is sturdily built and strongly braced. The rigid main frame holds each gang to its work—prevents shifting and sluing. The fore disks throw the soil out, and the rear disks cut just midway between the fore disks, throwing the soil back. Thus every particle of soil is thoroughly stirred and left level.

The Cutaway Light Tractor Harrow has adjustable hitch and can be adjusted to any engine. "A chain is no stronger than its weakest link," and it is well to remember that high-grade tractor equipment is quite as important as a high-grade tractor. You'll make no mistake in buying a Cutaway. It has cutlery steel disks, forged sharp, oil-soaked hardwood bearings and is backed by more than half a century's harrow-building experience.—[Adv.]

Coal Oil to the Rescue

On account of the shortage of properly insulated freight cars, the railroads are furnishing to shippers of produce ordinary box cars lined with paper and equipped with kerosene heaters.

The Standard Oil Company informs us that shippers of apples and potatoes, apples particularly, have taken to the idea and are now taking ordinary cars from the railroads and equipping them with heaters. The company's main station at Tacoma, the report says, sold out its entire stock of heaters in a week, to parties in the fruit-packing districts of the Northwest, and still the cry is "more heaters"!

Most of these heaters will go east and never come back, but the fruit crop is moving, thanks to the efficiency and reliability of the modern kerosene heater.—[Adv.]

RHUBARB



NOW IS BEST TIME TO PLANT
Wagner's Improved Winter Rhubarb

If planted now you should derive good results. Also Berries and small fruit. Write for prices. **J. B. WAGNER, Rhubarb and Berry Specialist, Pasadena, California.**

"Great Crops of

STRAWBERRIES and How To Grow Them"

is the best and most complete book on Strawberry Growing ever written. It fully explains the KELLOGG WAY of growing two big crops each year—a big profit in the Spring and a bigger profit in the Fall. Tells everything about strawberry growing from start to finish. Write for this book and learn how to supply your family with delicious strawberries the year 'round without cost, and how to make \$500 to \$1200 per acre each year. The book is FREE.



Strawberries grown the KELLOGG WAY yield more dollars per square rod and do it in less time than any other crop. The profits made from strawberries are enormous. One acre of strawberries grown the KELLOGG WAY will yield a greater cash profit than twenty acres of common farm crops.

\$1412.50

is the amount Frank Floniga of Oklahoma made in a single season from one and one-half acres of Kellogg Pedigree Plants grown the KELLOGG WAY. Others are doing fully as well.

Our 64-page free book will tell you how to make these big and quick profits. A postal will do—the book is FREE.

FREE BOOK

**R. M. Kellogg Company,
Box 355 Three Rivers, Mich.**

Nice Bright Western Pine FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

**Western Pine Box Sales Co.
SPOKANE, WASH.**

Praises Orenco Trees

Mr. C. B. Hill, Oak Point, Washington, writes:—"I hear nothing but praise of the nursery stock you have shipped this fall."

Similar statements are received from scores of customers in different sections, which proves that planters recognize and appreciate the high standard of **ORENCO TREES** and the fresh, vigorous condition in which they are received.

ORENCO TREES are sold only by our own salesmen and shipped direct from our nursery, reaching you in a fresh, vigorous and healthy condition. **ORENCO TREES** are NOT handled through dealers. You may buy scrubby trees for less money, but you can't buy **BETTER** trees for more money.

Don't fail to get our prices on Superior Orenco Trees on any list, small or large, you may need. Consultation and advice perfectly free and willingly given.

**Orenco Nursery Company
Orenco, Oregon**

**A Salesman's Position Now Open
Write for Particulars**

Packing School for Apple Men

Oregon apple men will be offered an opportunity to study and practice apple packing in a special packing school to be held at the Agricultural College in the second and third weeks of January. Hundreds of carloads of apples will be shipped for the first time from a large number of new orchards just coming into bearing in the Willamette Valley, the Umpqua Valley and in some other districts of Oregon. It is important to the success of the apple industry in these new districts that the first shipments are carefully graded and packed, to give the fruit a good standing. But unfortunately many of the growers will have had little or no experience in grading, packing and handling apples in commercial lots, and it will be very difficult to secure expert help from the leading apple districts. For these reasons, the College Division of Horticulture offers the course in grading and packing. A modern type of warehouse will be equipped for this work and one of the best and most up-to-date apple-grading machines will be used. Conveyors, gravity carriers, such as are being installed in some of the best type of community houses, will be provided. An expert apple packer will be in charge to teach the students apple packing, and sufficient time will be given so that the packers may become fairly expert and reliable. Special attention to the handling of fruit has been given by Professor Lewis, chief of the division, during the last two years, and this information will be made available for the students in attendance. A good supply of apples will be provided and they will be brought to the packing room, where they will be handled according to the best commercial methods. Expense of this will necessitate a very small fee, but the work will be condensed into two weeks. Orchardists unable to attend may take advantage of the work by sending a trusted helper.

Spraying for Pear-Leaf Worm.

The pear-leaf worm, an insect which does considerable damage to pear orchards, especially on the Pacific Coast, is easily controlled by spraying. A contact spray is usually effective in controlling the insect in the larval stage, and should be applied when the blossoming period is about over and two-thirds of the petals have fallen. The following formula for a contact spray is given in a new professional paper of the Bureau of Entomology, U. S. Department of Agriculture: Fish-oil soap, 1 pound; water, 25 gallons; nicotine sulphate (40 per cent concentrate), 1 to 1,200 parts of the spray. When the infestation is severe and promises destruction of the foliage, a poison spray, made of 4 pounds of lead arsenate to 100 gallons of water, should be used. The best time for applying this is when the holes in the leaves are not larger than one-half inch in diameter.—Office of Information, United States Department of Agriculture.



Fancy Fruit

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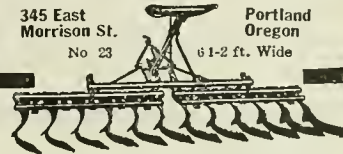
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Dust Spraying

Continued from page 10

the other advantage of making an application when it would be impossible to apply the liquid, and this often means the saving of a crop. So, with these two points standing out, as well as other advantages, I believe the dusting method has merits which warrant the consideration of any progressive fruitgrower.

I want to say here that in comparing the dusting method with the liquid method of spraying, it is not a fair measure of comparison to test them side by side the same as you would two liquid sprays. For, if the liquid could be put on at all times when it should be put on, the need of the dust spray would be less apparent. The beauty of the dust spray is that it can be put on at times when it would be impossible to put on the liquid, either because of weather conditions or of shortness of time. Therefore, if the dust is applied only at given times when the liquid is applied, results may show in favor of the liquid. But, even for sake of argument, should the dust be less effective than the liquid spray when applied on identical dates, there do come times when the whole value of an orchard crop depends upon spraying. Weather conditions or time limit prevent the application of the liquid and the crop is partially or wholly lost. The dusting method overcomes this and allows of application when the liquid spray has no value whatsoever. In this, in large measure, lies the efficiency of the dusting method,—and yet, as a matter of fact, orchards dusted in the same thorough manner as the liquid is applied, are showing quite equal results against apple scab, and superior results as against codling moth and some other insects and diseases. It is absolutely essential to have the materials very fine, and when a carrier is used, such as lime, gypsum, or talc, these also must be approximately as fine as the insecticides or fungicides used, and even and thorough distribution is necessary. Professor Childs has told you of the necessity of having fine mist in liquid spray, and you all know that even with the finest mist spray the tendency is for the spray to gather in globules, and when dry, leaves the effective material in spots. The area between the spots is unprotected. With the dust properly applied the whole surface is evenly covered.

The dust is applied by means of a blower. The blowers used in large orchard work are driven by gasoline engines, and the engines you are using on the liquid-spray machines can be utilized for this purpose, thus saving a part of the cost for a blower outfit. An efficient blower can now be obtained. With it the materials are evenly fed into the air pipe, with a control on the feed so materials are not unnecessarily blown out, and providing for discharge equal to work required. This blower is mounted on any wagon or truck, and requires two men, or a man and a boy,—one to handle the team and the other to care for the discharge pipe.

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In operating, the work should be done from the windward side so the dust is carried from the operator through the orchard. The team is kept in motion and as the operator comes opposite a tree, if it be a large one, he makes a circular sweep from bottom to top and down, so as to quite completely cover the individual tree. The application should be made on both sides. This may be accomplished when winds change, or during the quiet hours of the morning. If it becomes necessary to make application during constant windy weather the team should be driven into the wind, and the operator apply to both rows, right and left, allowing dust to drift to the rear.

The question has been asked, "Can the dust be used as a dormant spray?" In answer to this I will say, we do not recommend the dormant spray as yet. We have successfully used the soluble sulphur as a dust application for San Jose scale for two seasons, but we are not yet able to produce this material in commercial quantity for that purpose. The dormant or delayed dormant spray with soluble sulphur or lime-sulphur as a liquid should be applied as usual. It is surprising the way the dust adheres to the foliage and fruit. You all have noticed how road dust sticks to trees along the way, even after winds and rain; then you know that there is on the young fruit a fine hairy fuzz into which the dust settles and by which it is held. Even after the fruit has become well grown and becomes apparently smooth, the evidence is the dust has uniformly produced fruit free from side worms. Even should the dust wash off a little more quickly than the liquid spray, you can repeat the dust two, three, or four times and still be ahead of your liquid spray in point of labor expense and time. This is because the dust can be applied so much more quickly. The cost of materials will at least be equal to the cost of the liquid material, but the cost of application is one-seventh to one-fifth as much as cost of liquid application, and you all know the cost of labor in these applications is the big item.

Sulphur works better if mixed with some other material. If using sulphur alone there should be mixed with it at least 10% of finely pulverized lime, gypsum, or talc. If using 10% or 15% lead no other diluent is needed. A combination which makes an all-around good application consists of 40% of tobacco dust, 50% sulphur and 10% arsenate of lead. This requires no other material as a carrier.

The dusting method has been developed at a time when most needed, as its economy will be appreciated by all commercial fruitgrowers who are only too well aware of the necessity of reducing the cost of production at every possible point. This method will also be found of great value to growers of alfalfa in control of the alfalfa weevil, and of aphids, and of grasshoppers; and to the hopgrowers in control of plant lice, and there are other possibilities for its usefulness to be yet further developed.

The Cleanest Apple Crop

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Ninth National Apple Show

Continued from page 8

and perhaps have compelled overcrowding of other markets with the better varieties.

In considering the "doubtful" varieties, Mr. Sickles said the location of the orchards and the size of the fruit produced were distinct factors in determining, in each given case, whether the variety was profitable.

"Last year the growers of the Northwest shipped 1,000 or more cars of infected fruit into hundreds of markets," Mr. Sickles went on. "In some cases these shipments paid the grower a profit, if the shipment could be considered as standing by itself, but I do not need to say that the total result of this wormy campaign was a tremendous loss to the growers of the Northwest."

Washington State College won the student judging contest at the Ninth National Apple Show. The winners follow:

First, Roy Larson, Washington State College; second, L. M. Bowman, Idaho University; third, C. L. Firestone, Oregon Agricultural College.

Competition was keen, as the final scores show: Larson, 93.32 per cent; Bowman, 90.78 per cent, and Firestone, 90.25 per cent.

The contest this year was conducted along original lines. The contestants were permitted to assist the regular judges in their work for one day, studying their methods and profiting by their scoring of disputed points. The students were then delegated to judge ten entries unaided, which they had not seen the board judge. The judges then made their awards on the same ten boxes, and the students whose scores most nearly approximated the official figures were declared the winners. Mr. Tweede stated that the scores of the students on the entries were approximately the same as those made by the board.

A great feature of Apple Show week this year was a unique carnival which the business men of Spokane staged to make the time pleasant for their visitors. The apple idea was carried out successfully, as King Pip IX, impersonated by Frank T. McCollough, and Princess Apple Blossom, Miss Florence Russell of the Spokane Valley, ruled over the various events of the carnival.

Six of the important fruit districts of the Northwest sent to the Court of King Pip their most charming maidens to act as the princesses of Apple Land. During the week the royal party was the center of a series of brilliant ceremonies and social functions culminating in a visit from King Boreas of the St. Paul Outdoor Winter Sports Carnival, and Mr. Louis W. Hill, president of the Great Northern Railroad. Never before has the carnival spirit taken such a complete hold upon the people of Spokane and the Inland Empire. Old and young, rich and poor forgot their woes and joined in the merry making on the streets. Thousands wore special carnival costumes in the Apple Show colors—red, green and yellow.

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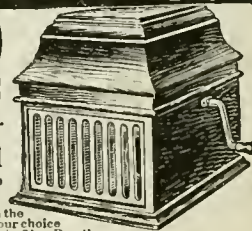
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At the show the women's department was the largest in history. To stimulate consumption of apples, expert cooks and demonstrators showed how to concoct a thousand and one toothsome delicacies with the apple as a base. Then, too, several hundred women had their finest pies, jellies, preserves and other home-made apple by-products on exhibition during the week. One of the racks at the show which attracted much attention contained apple pies from some of America's famous hotels. The pies from the Clift and the St. Francis in San Francisco were eighteen inches in diameter.

A new feature this year that probably proved of more interest to the fruitgrower than any other one feature in the Apple Show was the operating packing house. This was a fruit-packing house actually grading and packing commercial apples that were later shipped to the East and marketed. The apples were part of the regular stock of the Spokane Fruit Growers' Company taken from Otis Orchards. In the packing house various methods prevailing in the different districts were illustrated. Part of the output was run over the old-style belt sorter, and were sized and packed by hand. The balance of the output were demonstrated in the conveyors over a Cutler sizing machine. Modern methods were demonstrated in the conveyors that lead from all machines and packing bins to the nailing press and from there to the warehouse, and many other labor-saving devices available for packing and warehouse use were shown in actual operation. The interest displayed by fruitgrowers in this feature was so great that this idea will undoubtedly have to be expanded next year to cover a much larger space.

Codling Moth Investigations

Continued from page 12

During 1915 by far the greater percentage of worms of the first generation entered the fruit through the side rather than at the calyx end. In view of this fact it would be supposed that the calyx application would not prove of great value in controlling the moths and that the second codling moth or thirty-day spray, which is applied at the time the eggs are hatching, would be sufficient to keep the insect under control. It is shown clearly that one application, whether it be the "calyx" or the one preceding the hatching of the eggs, will not control the moths. In Experiment 1, where the calyx application only was applied, 10.8 per cent of the fruit was found to be infested by the middle of July. The application was slightly less effective than the one applied only at the time that the eggs were hatching (Exp. 4). The infestation in this experiment amounted to 9.7 per cent. In Experiment 3, where both the calyx and the "30-day" spray were employed, highly satisfactory results were obtained. In this experiment .8 per cent only of the fruit was injured by the first generation of worms.

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WHAT DID I TELL YOU, UNCLE JOHN?
GOOD GOODS, HEY, WHAT?

GOL DINGED IF IT AINT!
YOU DON'T HAVE TER
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ISNT HALF AS BIG
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AND WILL LAST LONGER.



THE young fellows teach the old ones and the old ones teach the young—that's the way it is with W-B CUT chewing right along. Less chewing for feeble jaws, less chewing for husky jaws—but the big point is *satisfaction*. Never before has there been so much satisfaction in so *little a chew*. It's *rich* tobacco, W-B CUT is. It makes you feel sorry for the fellows who chew so much of the old kind for so little benefit.

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From the results that were obtained during the past year it is safe to say that two well-timed, thorough applications will control the first generation of worms even in an orchard in which codling moth during the year previous destroyed 50 per cent of the crop.

On account of a very light crop existing in the experimental orchard, the owner felt that he could not afford to make many applications during the season. A greater portion of the orchard was sprayed as shown in Experiment 4, which permitted an infestation of 9.7 per cent over a greater portion of it. One summer application was made on August 10. It was well directed for an ordinary infestation as this was the time at which the first eggs of the second generation were beginning to hatch. The single application proved wholly inadequate and a very serious infestation occurred during late summer. This pronounced increase in the number of wormy apples is shown clearly in Experiment 3. On July 15, .8 per cent only of the fruit was found to be infested; at harvest time this had increased to 17 per cent wormy and, owing to the fact that 16 per cent possessed "stings," a total fruit loss of 33 per cent occurred.

The outcome of our experimental work during the past season makes it advisable that the station recommend two different schedules of sprays to be applied in handling the codling-moth situation during the coming season. The use of one or the other will be dependent upon the degree of infestation that occurred in the orchards during 1915. Orchardists must decide upon one or the other and follow it throughout the season or poor control will probably result.

The first two applications will be the same in both cases; that is, the calyx and "30-day" spray, for the control of the first brood of worms. Where a loss of not more than 8 per cent was experienced in 1915, one well-timed summer spray should prove very effective in controlling the second generation. This should be applied in early August. The date will be dependent upon weather conditions and the station will give out information at the time. Where the infestation during 1915 was found to be more than 8 or 10 per cent, two summer applications should be made to control the codling moth. The third spray should be made about July 20 and the fourth toward the middle or last of August.

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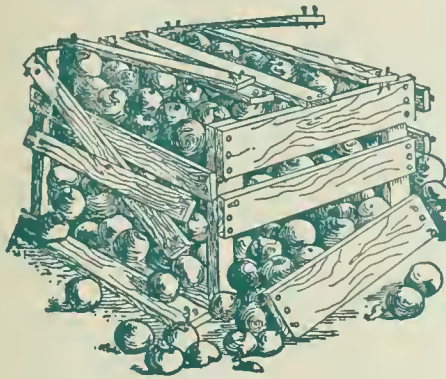
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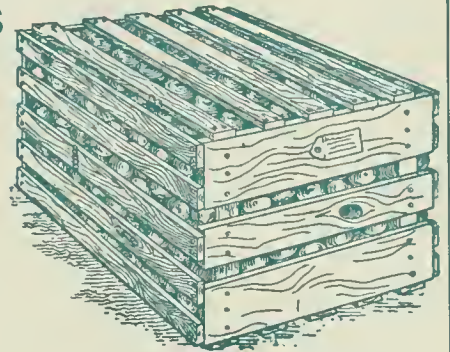
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BETTER FRUIT

VOLUME XI

FEBRUARY, 1917

NUMBER 8

SPECIAL FEATURES IN THIS EDITION

Pruning, Spraying, Fertilizing,
Grade and Pack Rules and
Apple Price Conditions



Courtesy Pearson-Ryan Company

It is hoped this illustration will suggest to every fruit grower and farmer the importance of a good vegetable garden. With the use of a steam pressure canning outfit every fruit grower can put up enough vegetables to last during the entire winter—a big saving in expense. Fruit growers with small orchards will find truck gardening a very profitable diversity line.

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Both of the Mitchells embody hundreds of extras, paid for by factory savings. They give you at least 20 per cent extra value over other cars in their class. All because John W. Bate, the great efficiency expert, has cut our factory costs in two.

There are 31 extra features—things which other cars omit. On this year's output these extras alone will cost us about \$4,000,000.

There is much added luxury. We have added 24 per cent to the cost of finish, upholstery and trimming. That is all paid for by savings made this year in our new body plant.

And there is now 100 per cent over-strength in every vital part. That is, every part is twice as strong as strong as before. The evidence is that this double

strength makes the Mitchell a lifetime car.

Twice as Strong

The Mitchell standard for many years has been 50 per cent over-strength. Under that standard Mitchell cars have proved marvels of endurance.

Two Mitchells that we know of already have exceeded 200,000 miles each. Seven of them have averaged 175,000 miles each—over 30 years of ordinary service.

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It has taken years to do this. But we announce this year this double strength in every vital part.

Over 440 parts are built of toughened steel. All parts which get a major strain are built of Chrome-Vanadium. We use steel alloys which cost us up to

15 cents per pound. And all the parts on which safety depends are made over-size.

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That one fact will illustrate what this extra strength means in every vital part. For you know how springs break under shock.

Exclusive Values

These extra values are exclusive to Mitchell cars. No other factory in the world could include them at the Mitchell price.

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That is what pays for these extras. That is what pays for this vast over-strength.

Now a new body plant—building all Mitchell bodies—saves us a vast sum more. That goes into luxury—into heat-fixed finish, into rare-grade leather, into countless dainty details. The latest Mitchells are the handsomest cars under \$2000.

Go see these extras, which are numbered by the hundreds. See what they mean in a car. You will not want a fine car which lacks them.

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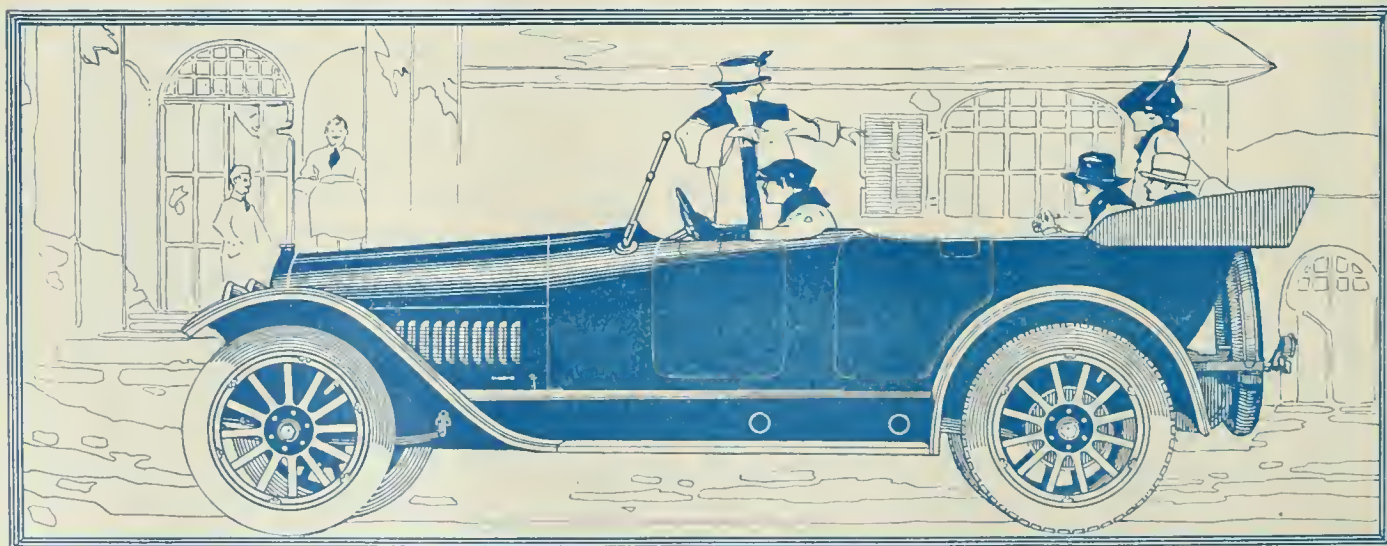
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Apple-Price Conditions, 1916—Can We Do Better?

By E. H. Shepard, Editor "Better Fruit."

I AM convinced we have the ability to solve the biggest problem that confronts the apple grower today,—the marketing and selling of our fruit at profitable prices.

I believe if the proper effort is made by the fruitgrowers in the right way that organization can be perfected that will control our marketing and selling in such a way as to secure greater efficiency, elimination of production at a loss, wider distribution, greater consumption, better prices, a good living and a fair profit on our investments.

We all know we have been experimenting for years, especially on the marketing of our apple crop. We know, and most of us will admit, we have made mistakes. It occurs to me we have had about enough experimenting. We have got experience, plenty of it. It has cost us a lot of money, yet we remain unorganized, with no settled policies that are acceptable and satisfactory to a large majority. It seems to me there is good reason to assume we have arrived at a period and are in a condition, financially and otherwise, when it becomes necessary to take stock. By that I mean we should review the past, profit from our mistakes, analyze the present and plan for the future with united effort and carry out our plans with determination. In other words, "it's time to clean house and call for a new deal."

Are you satisfied with this season's prices?

Before answering the question let us take stock of conditions. What I omit you must take into consideration. You must verify my statements and correct them, if in error, before determining for yourselves that this season's prices are satisfactory or unsatisfactory.

The apple crop in 1915 was 76,000,000 barrels.

The apple crop in 1916 was 67,000,000 barrels. 15 per cent less than last season.

The government estimate on value 1915 was \$2.02 per barrel.

The government estimate on value 1916 was \$2.76 per barrel. 36 per cent higher this season.

The apple crop on cold storage December 1st, 1916, was 20 per cent less than in 1915.

The apple crop of the Northwest was less than 6 per cent of the total. Our increased crop added 3 per cent more in 1916 to the total in 1915. The crop of the balance of the United States was 18 per cent less in 1916, making the total crop of the United States, as before stated, 15 per cent less than in 1915. Business is prosperous all over the United States except in a few

spots. There are no unemployed. Nearly all classes of labor are getting higher wages; money is plentiful; bank deposits are large and interest low.

There is not a district in the Union where the quality of apples is reported high grade in 1916 except the Pacific Coast States of California, Idaho, Montana, Oregon and Washington. California ships outside the state only Newtowns, which are exported. Idaho, on account of early frost, lost almost its entire crop. Montana produces at present only a few hundred cars, leaving only two states, Washington and Oregon, with a crop high class in quality.

Every product of the soil that the farmer produces except rice has advanced in price. Some products being more than doubled. Nearly every manufactured product has increased in price by leaps and bounds. The only product of the soil, except rice, that has not increased in price is Northwestern box apples.

Fellow fruitgrowers, why? Are you satisfied?

Our comparatively low prices are not caused by depression, because the country is prosperous. They are not due to our people being without money, because everybody is at work at good wages. They are not due to lack of money, because money is plentiful. In fact America today is the richest nation on the globe.

Interesting information on finances of the United States are shown in the statement of Edward N. Hawley, chairman of the Federal Trades Commission, in an address before the Ohio bankers, in which he stated the banking capital and surplus of the fifty-six domestic banks of England (exclusive of the Bank of England), with eight thousand branches, was \$500,000,000. The capital and surplus of fifty-seven overseas banks was \$500,000,000; the capital and surplus of domestic banks, loan and trust companies in the United States is \$3,400,000,000—more than the combined banking capital and surplus of all other nations in the world. With all this wealth, with every other commodity greatly increased in price, why are Northwestern box apples showing no advances, with large quantities selling for less than in 1915.

There must be a reason.

I submit the problem to you for your consideration. In doing so permit me to avail myself of the privilege, if you please, of giving you some personal opinions. I feel justified in my remarks with the hope the growers and marketing concerns, as well as other identified interests, will tackle some of them,

and in doing so create a movement that will evolve a plan that the majority of the apple growers will adopt, with reasonable assurances of securing better prices.

I believe our success depends on organization and control, not in the Northwest as a whole, but in each individual district.

In other words, it is my opinion, take it for what it is worth, that each individual district has got to work out its own solution, boss its own job, instead of "letting George do it."

We grow the same varieties, but they vary in color, size, grading and packing and other characteristics. It is a recognized fact by the trade the same variety in the same grades and same sizes vary in value in different districts. Few districts will be content with a less price for the same variety, grade and size, sold through a common co-operative selling organization. I don't believe any more convincing evidence on this statement is necessary than to call your attention to the jealousies aroused by differences in prices obtained by the North Pacific Fruit Distributors. The further fact that they abandoned the central selling plan, placing the matter of selling and prices in the individual districts, seems conclusive.

There are some features common to all districts for general improvement that seem worthy of attention.

We all know that we planted extensively, but, alas, not wisely. We planted hundreds of thousands of acreage, building an output which developed suddenly into millions in 1912, without either adequate or satisfactory selling organization. I don't wish to comment at length upon this acreage. It represents an investment that must be saved if within our power. But I do wish to impress upon your minds a few facts that are obvious to those who will pause and consider, take stock and find out where they are at.

There are thousands of acres of apples in districts where soil, climate or conditions are such that apples will never make for the owner the profit per acre he can make on other crops. The only sane advice is, dig up the trees and grow some other crop.

Another feature of the apple business that needs correction is varieties. We have about two hundred varieties, more or less. I believe the varieties that will prove profitable to a certainty in future years are few, the list short enough to name in a minute,—alphabetically,—Arkansas Black, Delicious, Gravenstein, Grimes Golden, Jonathan, King, Ortley, Rome Beauty, Spitzen-

berg, Winesap, White Winter Pearmain, Winter Banana, Yellow Newtown Pippin.

I doubt if the real money makers in the list will exceed half the number. There is a doubtful class, as specified by Mr. Sickles at the conference of the Ninth National Apple Show, as follows: It is a question of judgment to determine the best thing to do with them. The following may be mentioned in the doubtful class: Aiken Red, Baldwin, Delaware Red, Gano or Black Ben, Hydes King, King David, Mammoth Black Twig, Missouri Pippin, Red Cheek Pippin, Stayman, Vanderpool, Wagener, York Imperial.

There is a third class that are not grown in any great quantity, but of which some orchards may have quite a few, which in a commercial way have never proved satisfactory. In addition it may be stated that in all probability, if records were searched during the last four years, they would show that none of these varieties that were shipped out of the state have actually paid the growers the cost of production. This list, as specified by Mr. Sickles, consists of Apple of Commerce, Ben Hur, Bismarck, Canada Red, Chicago, Champion, Fall Wine, Hoover, Ingram, Kaighn Spitzenberg, Kentish, Kinnard, Manning, Northwest Greening, Pawaukee, Rambo, Salaom, Shackleford, Wallbridge, Willowtwig.

The first list includes thirteen varieties, of which I believe about eight varieties will permanently prove good money makers. The second list consists of thirteen varieties. In this list there are scarcely any varieties which would be considered good enough commercial varieties to justify any great hope. However, it is possible that while no general trade may be developed for them that would bring satisfactory prices the opportunity for disposing of them at fairly satisfactory prices, prices that would afford the grower a little over the cost of production, may be found in limited districts, particularly in years of light crops.

The third list consists of twenty varieties. I don't believe there is a single variety in this list that could be considered a commercial variety that would justify its continuance. However, it may be that many growers who have them may develop a local trade for small quantities, which might be a better proposition than digging them up or grafting them over.

In addition to this there are about one hundred and fifty varieties more that are grown in small lots throughout the Northwest, none of which will probably pay the grower a profit.

To go into this matter in detail would require more time than the limited space I have would permit. Therefore about the only thing I have further to say on this subject is that every grower should give the matter careful attention, ascertain his cost of production, find out his average price for the last four years and decide the matter for himself.

Grades and sizes of varieties that don't pay is another problem we must

face. There are some varieties that bring fair prices in Extra Fancy and Fancy, but in C grade do not pay the extra cost of packing. The same is true in reference to small sizes, yet we go on packing at a loss or receiving less than we could sell for at the vinegar factory. When a customer orders a box of apples he does not want a box of marbles. When an Easterner buys a box of Northwestern apples he expects quality, not trash. We are ruining our reputation and killing our markets by putting on the markets poor varieties, low grades and marbles. An illustration is frequently more convincing than argument.

The City of Portland is an illustration of a market which apple growers persistently and continuously have done their utmost to demoralize. It is a prosperous city of 280,000 people or more. The people are well-to-do—they buy quality goods in all lines of merchandise, clothing, food, everything generally except apples. Within wagon haul are located many apple orchards. Cheap river transportation reaches nearly every fruit section in the state except Southern and Eastern Oregon. When an apple grower in Oregon has a variety so poor he is afraid to put on freight charges he ships it to Portland. When he has a good variety he ships the Extra Fancy, Fancy and C grade East, the balance he packs up and dumps on the Portland markets.

Portland should consume from 500 to 1,000 cars of good apples. The growers have spoiled their own home market for good varieties and good grades with trash.

Does it pay to grow poor varieties and pack poor grades and small sizes. My advice to every apple grower is, figure it out in accordance with your own costs, whatever they may be. As an illustration I will use my way of figuring, in round figures:

Cost of boxes, k.d. ....	.105
Cost of hauling ....	.005
Cost of making up boxes ....	.01
Cost of paper ....	.05
Cost of packing ....	.04
Cost of nailing up and stenciling ....	.01
Cost of packing house sundry ....	.01
Total .....	.23
Value at vinegar factory, \$12 per ton....	.12
Total .....	.35
Add the cost of Association, labeling, cold storage, advertising and selling....	.20
Freight to east .....	.50
Jobbers' profit, say 10 cents .....	.10
Grand total	\$1.15

Any grade or size that will not sell at wholesale or in the East for more than \$1.15, with me, goes to the vinegar factory. Equivalent to 65 cents net cash f.o.b.

Take this wholesale price of	\$1.15
Omit value at vinegar factory previously included .....	.12
Balance	\$1.03
Add the cost of packing .....	.05
Add the cost of hauling to packing house ..	.01
Add the cost of grading .....	.01
Add the cost of hauling to depot .....	.02
Add the cost of growing .....	.35
Total	\$1.50

Any variety that won't wholesale in Eastern markets at over \$1.50 will not

pay more than cost. However, this determination should not be made too hastily by the grower, or on one year's returns. The proper method would be to take a four or six-year average of the past because an even number of years would include an equal proportion of low and high-price years.

My figures are not exact, but sufficiently so to illustrate. In this work we should have the assistance of every selling concern in furnishing the selling prices in the past four or six years. In furnishing this information they will not only help us to eliminate packing or growing at a loss, but they will eliminate for themselves a lot of grief and a lot of cussing.

Just a word about the importance of apple recipes for dessert in connection with sales and consumption. I think too few of us realize its importance. Every box of apples should contain a neat, small booklet with a few good recipes, because more apples are eaten cooked by our customers than fresh. If you don't believe it just observe the next time you visit any well-to-do family in a city, or take a meal in any hotel, restaurant or dining car. I'll venture the statement that almost 99 people out of a hundred of the well-to-do eat an apple baked, as sauce, in pie or some other cooked form to one apple fresh.

A word to the ladies, to the ladies in the cities, I mean the ones who are hollering about the high cost of living, and boycotting eggs, butter, turkeys, chickens and a lot of other things we farmers produce by working hard from sunup to sundown, including apples. We farmers and fruitgrowers at best are making only a modest living. If you dear ladies in the city will buy just a few less silk stockings, a few less high-price dresses, a few less expensive bonnets and curtail your expensive habits, in a word, put less money on your back and your indulgences and more money into good, wholesome food, particularly box apples, you will have better health and more money at the end of the year.

From my past experience it seems to me that we are justified in the conclusion that each district must work out its problem of organization, control and selling. To perfect an organization requires a great many meetings of the people interested. You can understand the impossibility of getting growers from all of the different districts together frequently enough to perfect the right kind of organization, on account of the time required and the expense. However, I do believe that representatives from each district should attend the Growers' Conference at the National Apple Shows, for the purpose of getting the benefit of each other's experience, as well as for the purpose of working along the same lines so far as advisable and necessary.

A long time ago I made the statement, and have repeated it many times since, that I did not believe that any co-operative selling concern would be a success until each district was organized. Our experience, it seems to me,

has verified this opinion. I firmly believe we should receive better prices this year. I have asked the question, Why? It is because we lack organization in each of the different districts, because we lack control. We are too much divided in practically all of the districts. By that I mean there are too many different ways of selling, too many competing concerns without any one concern handling a sufficient amount of tonnage to control the situation. Where there are twenty concerns in a district, each handling a small amount of tonnage, there is a large duplication of overhead expense. Each one employs a sales manager, whereas this part of the business could be handled by comparatively a few and the rest of the money, which is spent on sales managers at the present time, could be used to employ salesmen to cover the different districts in the United States thoroughly. Where you have a number of institutions and one in control with a large tonnage, that institution is a big factor in setting and controlling the prices, whereas with a large number of small institutions, with each one competing with no one in control, it occurs to me that the weak sister is the one that frequently and most frequently sets the prices.

Suppose your association or selling concern puts up a number one grade

and pack, high class in every particular. It has an actual market value of 25 cents more per box than some of the other concerns. If the weaker concern putting up a poor grade sells at \$1 per box then your price is \$1.25. If the weaker sister sells at 75 cents your price is pulled down to \$1.

I am inclined to believe that this has actually occurred, that the price is unnecessarily low this year in accordance with all conditions as previously specified, and that the reason for it being low is that there is "no control"; that some of the weaker sisters have set the prices, or some of the growers who are awfully anxious to realize money quickly, *f. o. b.*, have sold at unnecessarily low figures.

Conditions may be different in different districts. There are different ways of selling our apples. They can be sold through co-operative institutions, through private incorporated companies, *f. o. b.* cash sales, by auction, on consignment or on commission with guaranteed advance. It is up to each district to determine which will be the most satisfactory way. A large majority having adopted a certain plan for disposing of our crop would control the situation if the method selected was the best.

The day of the small jobber and the small manufacturer, if we are to judge

from modern business, is practically past. The business of the United States today is being done by large jobbers and large manufacturers. Large institutions, on account of the large volume of business, can systematize their business more perfectly; they can introduce systems of efficiency, hire men of the greatest ability; therefore they are equipped for doing a better business, and that they are successful is evident from the number of big manufacturers and jobbers that are in existence today and the lack of small ones.

It seems to me this pertains to the apple business just the same as any other business. If we have fifteen or twenty concerns you know and I know they are limited in the number of salesmen they employ. Naturally these salesmen are sent to the cities and territories where the largest number of cars can be sold. Hundreds of smaller cities and towns are neglected. The result is the large cities are congested and glutted, the smaller ones overlooked. The prices in the big cities are low on account of the glut. It seems to me if we had a fewer number of concerns, or strong combinations of existing concerns so that the territory of the United States could be covered more thoroughly and more efficiently, a greater volume could be sold and at less expense.

Spraying Orchards with Reference to Aphis Control

By S. W. Foster, Entomologist and Manager Insecticide Department General Chemical Company, San Francisco

TO obtain the best results from the use of sprays in an orchard, we must use and intelligently apply that material or combination of materials which will do the greatest amount of good toward controlling all the insect and fungus diseases detrimental to the particular orchard treated. Washington fruitgrowers are familiar with the usual practices for the control of codling moth, San Jose scale and some other orchard pests. However, there are certain troubles, particularly powdery mildew and some species of aphids which are not so well known but which are becoming more generally important each year to the fruitgrowers of this state because of the increased amount of damage done to the trees and fruit. The really successful fruitgrower of the future must take full cognizance of all pests and conditions which lessen the amount of fruit produced on a given area or prevent this fruit from being of the best possible quality.

What I have to say in this article deals primarily with the control of aphids,—the rosy apple aphid, green apple aphid and woolly apple aphid. These so-called plant lice can be successfully controlled without increasing materially the number of applications of spray now applied each year to the average well-cared-for orchard. A few words regarding the life history and habits of these insects might not be out of order, although I shall not attempt to give you a technical detailed discussion of the subject.

Woolly apple aphid has one form above ground which attacks the leaves and twigs primarily during the growing period. Another form exists throughout the year on the roots. These forms are interchangeable, as it were, because some of those living on the limbs and branches of the tree during the summer go to the ground, while many of the ground-inhabiting form move above ground to the limbs and branches. This migration from roots to limbs and from limbs to roots keeps up to some extent throughout the growing season. However, the principal migration from the trunk and limbs of the trees to the ground takes place about the time of the first cold nights in the fall of the year and the principal migration from the roots to the limbs and twigs takes place comparatively early in the spring. In the Eastern States there are usually six generations per year, but the life history has not, to our knowledge, been carefully worked out for the Pacific Coast territory under the varying conditions. The insects pass the winter, however, in our Eastern States both as eggs and as over-wintering lice on the roots of the trees and in some of the warmer regions individuals live throughout the winter in protected areas of pruning scars, wounds and rough places on the bark of the tree.

In addition to the migration from the roots to the trunk and limbs of the trees of apples, and vice versa, there is also a cross migration from apple trees to elm trees and back again. The

eggs are often laid during the fall of the year in crevices of the bark in elm trees, although these eggs are frequently deposited on other trees. In the spring the eggs hatch into forms producing what is generally known as stem mothers. These stem mothers may be often found, by careful examination, upon or near the buds of elm trees or other trees, where the eggs have been deposited, before the buds open in the spring. Soon after the first leaves appear the stem mothers begin feeding on the under side and the leaf soon curls about the insect, giving some protection for the production of the first generation of young lice.

This generation is wingless and lives either on the curled leaves or upon the tender twigs. The third generation can usually be found on the elm leaves or leaves of similar plants, but this generation is winged and is known as the spring migrant. It usually migrates by flying to apple trees or similar food plants, settling on the leaves, twigs and young watersprouts. This winged migrant produces the fourth generation, which is wingless and which is usually the first important generation to be found on apple trees and is the generation which is first observed in any considerable numbers by the fruitgrower, making its appearance noticeable during June. This generation matures comparatively quickly and produces another, which is the fifth generation, giving two full generations on the apple tree of wingless individuals. The greater part of this last generation

usually migrates from the young wood growth down the trunk to the roots of the tree, and this migration may extend over a period of two or more months, being most noticeable with the advent of the first cold nights in the early fall. All the individuals of this generation do not go to the roots, but some remain above ground and produce a generation of winged forms known as the sixth generation or fall migrant, which may be found about the trees in late fall but generally migrates to elm trees, where they settle upon the bark and produce true sexual forms, the females of which deposit a single egg each in the crevice of the bark, where the egg passes the winter.

It should be understood from the outset that means of controlling this insect must either be very thorough, which would also be expensive if the work is successfully done in a short time, or else that control measures must be practiced for a considerable length of time, which, with this special insect, usually involves careful work for at least three full consecutive seasons. Obviously, the more of the fall migrant that can be killed before they go to the ground or migrate to other places the better. Following this, the next practical means is to kill, by the use of contact insecticides, during June, July and August, as many as possible of those insects which can be found on the trees during that time. Specific direction in this regard will be given in the latter part of this paper after brief mention of the other two species of aphids under consideration.

The green apple aphid, usually known as the leaf-curling aphid, is in many orchards, especially on young trees, the most noticeable species of the three under consideration. Eggs are deposited in the fall of the year usually on the young wood growth and watersprouts, sometimes in great numbers. These eggs pass the winter as such, hatching in the spring of the year about the time wood growth starts. All eggs are generally hatched by the time the buds are open. From those forms hatching from the over-wintering eggs is started the production of an enormous number of individuals, which goes on for generation after generation for two months, or sometimes longer if the weather remains comparatively cool. Roughly speaking, about twenty-five days are required for the development of a single individual. The green apple aphid does some injury to the fruit by puncturing the skin, but its chief injury is caused from feeding on the foliage, resulting in curling, dwarfing and often killing the leaves to such an extent as to prevent further wood growth on the twigs attacked.

The rosy apple aphid is primarily a pest of the fruit. Injury from this species results in producing the so-called cluster apples, which are knotty, misshapen and of little or no commercial value. This is caused by the feeding of this species while the fruit is small. This species also feeds to some extent on the foliage and is undoubtedly quite a factor in aiding the spread of pear blight. This is also equally

true with the green apple aphid previously mentioned. The eggs of the rosy apple aphid generally hatch a little later in the season than those of the green apple aphid. This species is particularly noticeable on the leaves around the fruit clusters and on the stems of the fruit. This species usually disappears from the trees by mid-summer, but appears again in small numbers in the late fall where eggs are deposited on the trunk and older growth, but are not generally as plentiful as eggs of the green apple aphid.

The control of these species will now be considered collectively in conjunction with other spraying work necessary in commercially profitable apple orchards. During the dormant or winter season, many of the eggs of the green apple aphid can be killed by spraying the trees with lime and sulphur solution or with a good concentrated oil spray at the same time the work is done for scale control. In the use of these sprays, however, it is essential for success that the spray be applied in fair weather, and if rain follows within three or four days after spraying the application should be repeated. When the cluster buds begin opening in the spring it is time to do any spraying that is to be applied, if success is expected, for controlling the rosy apple aphid. The greatest part of the injury done to the fruit by this species is caused before the petals fall from the trees. For this work, after the cluster buds open but before blooming, distillate oil emulsion, 3% concentration, can be effectively and safely used, or a combination of whale-oil soap and nicotine such as Black-Leaf "40" may be applied. All apple orchards infested with mildew should be sprayed with atomic sulphur at the same time. The atomic sulphur may be safely and effectively combined at the rate of 12 pounds for each 200 gallons of spray with the distillate oil emulsion or with the nicotine used at this time for aphid control.

As soon as the petals fall from the trees, it is time to spray with arsenate of lead for codling-moth control. Dilute the distillate oil emulsion at the rate of 5 gallons for each 200-gallon tank of spray, adding the four pounds of arsenate of lead paste or two pounds of arsenate of lead powder for codling-moth control. If mildew is present or likely to cause injury, add 12 pounds of atomic sulphur for each 200-gallon tank of the diluted emulsion and arsenate of lead. These three materials can be safely and effectively mixed together in the same spray tank. The distillate oil emulsion used at this time should effectively kill any and all green aphid or rosy apple aphid which may not have been killed by the application before blooming. By the time of the second application of arsenate of lead for codling-moth control, about three weeks after the petals fall, it is likely that many specimens of the woolly apple aphid will be present on the trees. Also at this time it is questionable if the distillate oil emulsion can be safely used as strong as recommended for the earlier applications. Therefore at this

three-weeks' spray use three gallons of concentrated distillate oil emulsion for each 200-gallon tank of spray, and after this has been diluted in water add the arsenate of lead, and, if mildew is present, the atomic sulphur and one pint of Black-Leaf "40" for each 200 gallons of spray. If these directions are followed up to this time, all of the green aphid and rosy apple aphid present should have been killed and mildew under effective control.

At the time of the third application for codling-moth control, the woolly aphid will very likely be most abundant and it is important that the spraying be most carefully and thoroughly applied. Use the distillate oil emulsion, Black-Leaf "40" and arsenate of lead as directed at the time of the second application for codling-moth control. If at this time the woolly aphid is present in large colonies or clusters on the limbs and scarred places of the bark, it will be necessary to hold the nozzles close to the clusters of aphid and apply the spray with sufficient pressure to break up and practically wash off these colonies. Those growers who make a fourth application of arsenate of lead for codling-moth control should by all means use the distillate oil emulsion and Black-Leaf "40" in conjunction with the arsenate of lead if the woolly aphid is present in the orchard. Fruitgrowers must not expect to eliminate woolly aphid by one or two applications in one season. This summer work of combining distillate oil emulsion with arsenate of lead should be practiced for at least three consecutive seasons. In those orchards where the fruit is picked early in the fall a great deal of good can be sometimes accomplished by spraying the trees with a winter spray of oil just as soon as the fruit has been harvested. This would kill any scale insects that might be present and will also, if properly applied, kill all woolly aphid present on the trunks and limbs of the trees before they have migrated to the ground or other trees.

In conclusion I may say that considerable benefit will result from a careful control of these aphids aside from eliminating the injury done directly to the tree, foliage and fruit. The aphid family is undoubtedly the greatest factor in disseminating and scattering fireblight. It is unnecessary to warn you of the injury and loss caused by this disease, but please bear in mind that the spraying schedule previously outlined, if carefully and thoroughly practiced each year, will very materially lessen the spread of blight and greatly reduce the amount of blight cutting now necessary in many orchards because there will be fewer blight infections.

The Oregon State Horticultural Society, the oldest horticultural society in the Northwest, held its thirty-first annual meeting in Hood River, December 11-13. The meeting was well attended. The addresses and discussions were extremely interesting, instructive and valuable.



Herman H. Smidt, R. F. D. 3, Oregon City, Oregon, owner of these trees, read in *Better Fruit* that trees planted in blasted soil would grow faster and be better in every way than trees set in dug holes. He tried it, and on February 14, 1916, wrote as follows:

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Influence of Winter Pruning in Body Building

Professor C. I. Lewis, Chief Division of Horticulture, O. A. C., Before Conference of National Apple Show, Spokane, Wash.

WINTER PRUNING is a strong factor in the handling of a successful commercial orchard. It has much to do with the strength and vigor of trees and can be made to be an aid to fruit bearing.

Let us first consider how trees may be strengthened by winter pruning. One of the first points to consider is maintaining an equal development among the main scaffold branches. A fruitgrower may start with a tree having five main scaffold branches, but by the time the trees are fifteen years of age they may actually only have three, as the other two branches may have become so stunted that they are really only side branches of some of the remaining three. This condition can be avoided if in pruning the trees the orchardist will suppress the stronger branches by pruning them the most and encourage the weaker branches by not pruning them as severely. Thus he will reduce the leaf area of the stronger branches and encourage a larger leaf area on the smaller branches, and this will soon give him a balance and restore the weak branch to its proper place in the tree's framework. The growth which certain sections of the tree will make during the year is correlated quite largely with the leaf area exposed; while severe cutting of the branch might force a longer growth, it

would not give the total area or encourage the diameter as much as would the lighter pruning. In this, of course, we are referring only to the relation of one branch to the other on the tree, and not to the tree as a whole.

Second, the grower should strive to avoid weak forks which are caused by two branches of equal strength issuing from a common point. This weak condition of the tree can be easily avoided by always cutting one branch longer than the other, encouraging one to assume the role of a leader and the other the function of a lateral. Of two competing branches, the one cut the most grows the least.

Again, by an intelligent use of winter pruning one can control to a large degree the proper development of laterals. Spitzenbergs and Ortleys, for example, require heavy heading back, as they often become rangy and produce few laterals, while Yellow Newtowns and Grimes, on the other hand, tend to produce too many, and severe heading only aggravates the condition. Investigations conducted at the Oregon Agricultural College seem to note that winter pruning as compared with summer pruning, on the whole, aids very materially in causing a thickening of the branches and, as we will see later, this has an important bearing on the spur development of a tree.

It is practically recognized by all orchardists that whenever a tree lacks vigor, winter pruning will aid in returning the tree to a vigorous condition. This should be combined, however, with proper maintenance of moisture and soil fertility.

As regards the effect of winter pruning on fruit-bearing development, it results largely by maintaining the vigor of the tree in such a way that it can give rise to strong spurs and buds. The proper heading and thinning out of branches will have much to do with this healthy development. One should study closely the bearing habits of the tree. For example, those varieties which generally do not bear on terminals or on axillary buds, but which develop largely on spurs do not, as a class, tend to be heavy annual bearers. These include such varieties as Arkansas Black, Baldwin, Spitzenberg, Newtown and Rome. How essential it is, therefore, with this class that every encouragement be given to bring about strong spur development, for if we do not, some of these varieties may only bear once in three or four years. Other varieties tend to bear on axillary buds and terminals as well as on spurs, and some tend to bear on very young spurs. These include such well-known varieties as Jonathan, Winesap, Ben Davis,

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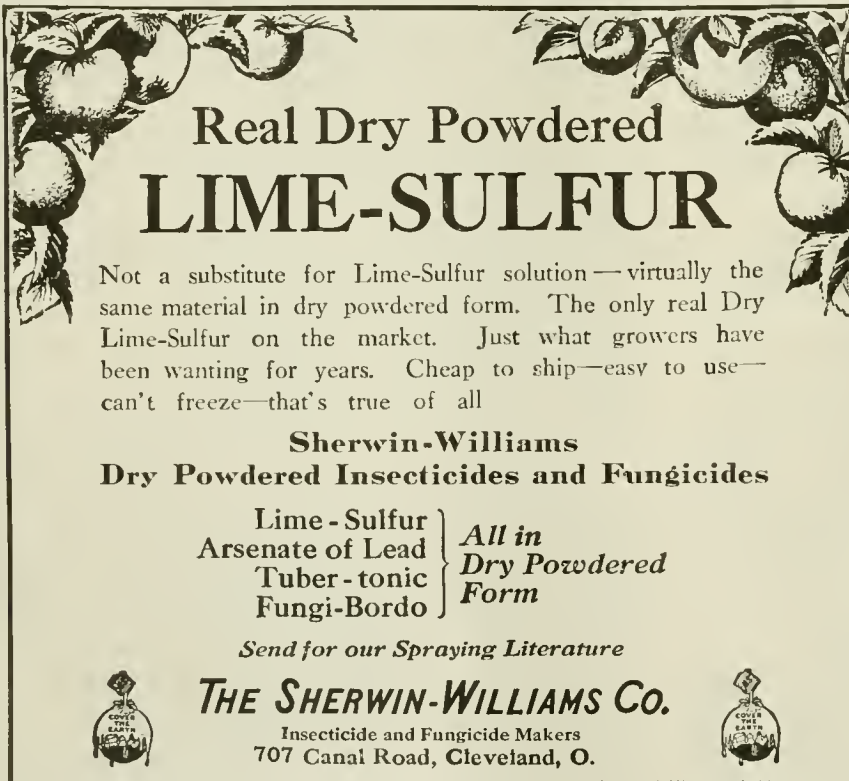
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ment of spur and bud, then a moderate heading back would be much superior, since you would cut off a much smaller number of buds and spurs and would not discourage the formation of a large number of new ones which might be true in the heavy heading back. In the same way, heavy thinning out is only a question of mathematics, it removes a much larger number of bearing organs, such as buds and spurs, than would light thinning, and a combination of light heading and thinning will probably generally produce the best results. However, I believe that many of our orchardists tend to head back too severely in the pruning of their trees.

If we combine summer and winter pruning we find they are really supplementary of each other. For example, if the June pruning consists largely of heading back, the winter pruning consists of thinning out and vice versa. Let us consider a few specific instances. We will take first young trees from six to eight years of age which naturally should be coming into heavy bearing. One must avoid over stimulating such trees by heavy pruning. The chances are these trees could be handled the best by a possible heading back in June, followed by a moderate thinning out in winter—or should they be in that condition that a thinning out is desirable in June, then possibly a little more thinning out or moderate heading back in winter would be desirable. In some cases these young trees get in such condition the latter part of July that a little thinning out, or even heading back, is very desirable, allowing more sunlight and air to reach the buds and spurs which would probably encourage them to become stronger, and probably stimulating less secondary growth than may be true with winter pruning.

When trees get to be eight or ten years of age and have never borne good crops, they should be checked as far as tillage, plant foods and irrigation are concerned, and the pruning had better consist of a very light thinning out until the trees reach heavy bearing. One had perhaps better sacrifice a little as regards size and color in the fruit, and bring the trees into bearing, rather than to attempt a type of pruning which might delay bearing entirely for a number of years.

After the trees once reach heavy bearing they will stand much more pruning. Let us consider the great class of trees which most of us are beginning to handle in the Pacific Northwest now—trees which have reached maturity and are in full bearing. With these trees winter pruning becomes to a large extent a thinning process. That is, it aids in reducing the number of specimens a tree might produce so as to encourage desirable commercial size of fruit. We should study these trees so as to keep a balance between the main branches, and we must constantly seek to avoid weak forks which will lead to fatal breakage. We must grasp firmly one principle of pruning in handling these trees, namely, that the greatest response in



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

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In the winter pruning which you would give young trees which have not as yet much spur development, the growth which occurs any one year varies more with the growth the trees made the previous year than on the amount of pruning. The amount of pruning does not control the amount of growth with such trees. The amount of pruning only determines the nature of the growth, as heavy pruning produces strong sprouts and light pruning

produces weaker sprouts, but more of them, so that the sum total is not changed. However, with mature trees that have much bearing area in the form of spurs, a different result might be obtained.

In pruning trees in the winter the pruning naturally takes the form of either a heading back or a thinning out, or possibly a combination of the two. If one desires simply some strong sprouts, then heavy heading back will produce that result; but if one really desires more fruit develop-

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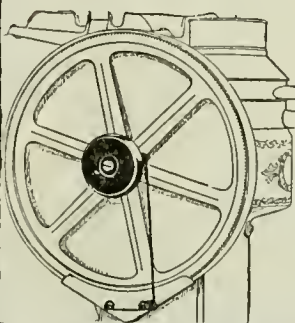
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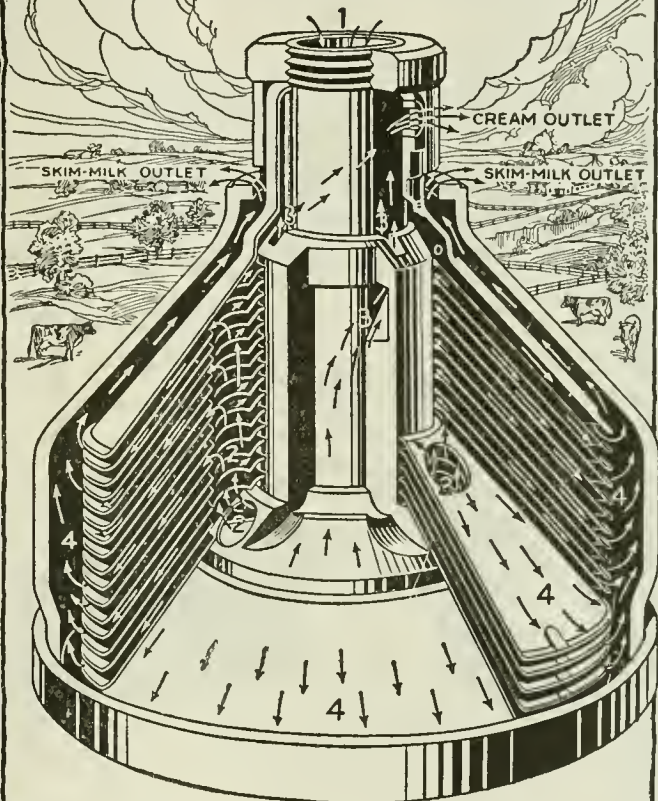
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pruning comes from a region in close proximity to the point where the cut is made. You have all noticed that when large pear trees are dehorned that the response is simply a whole lot of watersprouts just at the point where the branch was cut and that the portions of the tree remote from these wounds is not influenced in any sense. Possibly if it is influenced it is weakened rather than strengthened. If this principle is true, and it is easy to demonstrate that it is, why then the wise method of handling the tree would be to distribute the pruning as generally all over the trees as is consistent, planning that in our system of pruning all parts of the tree will become reinvigorated; perhaps not all in one given year, but certainly within a period of a few years. Every portion of the tree must be reached. If you do not do this, sooner or later, all the fruiting portions of the tree will be at the top and outside.

In our work at the Experiment Station we have demonstrated that where groups of spurs are thinned on pear and prune trees, for example, that it results in a reinvigoration of the surrounding spurs and leads in a few years to the formation of very strong

buds and spurs on the new wood caused by the pruning. By actually reducing the number of spurs in certain portions of the tree we have reinvigorated the remainder, making them more fruitful, causing them to produce better fruit and at the same time laying the foundation for the development of new spurs and buds. In our winter pruning the more we can reach the various parts of the tree the nearer we will be to keeping the trees producing high-grade fruit.

In our work at the Experiment Station we have recently completed a study of spurs and the work shows clearly that the percentage of spurs that bloom decreases as they get older and that the percentage of spurs bearing fruit decreases even faster as they get older. In other words, some spurs may have strength to blossom, but do not have enough reserve energy to mature fruit. Spurs decrease in the amount of fruit for each spur as they become older. The amount of growth that a spur makes for a given season has a close relation to its bearing the following season, and there is also a relation between heavy bearing and length and diameter of spur. Lastly, branches that have a large diameter

have stronger spurs and bear more fruit.

It seems to me that these investigations with spurs indicate very clearly what our method of procedure must be with our heavy-bearing orchards, namely, that we must develop strong spurs and that we must head and thin in such a way that we distribute the stimulus over all parts of the tree, avoiding confining our pruning to two or three parts of the tree. One should attempt to develop a fair amount of new wood annually in order to provide for the necessary increase of new buds and spurs essential to the best tree development.

In preparing this article I have drawn freely from our published investigations as shown in Station Bulletins 130 and 139.

Discussion

Question: Is it desirable to prune in the winter irrespective of temperature?

Professor Lewis: I would not prune at a low temperature, where the wood was frozen. I do not know any one doing work to tell at what temperature you can prune. I remember in 1908 we got a great deal of black heart and personally I felt that the trees having been pruned in a frozen condition had something to do with it.

Question: Are trees in this locality dormant enough to prune now?

Professor Lewis: That would depend somewhat on the nature of the pruning. If they are hardened up thoroughly you might do some thinning out.

Question: Are cuts made in the winter as susceptible to blight infection as those made in the summer?

Professor Lewis: Probably not. Blight at this season is in the dormant form and in the summer it is in the active form. We are finding that it is probable in cutting blight we have got to have a repellant as well as a disinfectant. You can cut a branch and disinfect it, and an insect may come along later and reinfest it unless there is a repellant. One of the biggest problems now is to get a repellant and disinfectant.

Question: Wouldn't the cut made in the winter have an opportunity to dry to prevent infection before the new growth came in the spring?

Professor Lewis: That would be my opinion, but please take that only as an opinion.

Question: Would you thin fruit spurs on trees just coming into bearing?

Professor Lewis: The trees to look out for are the trees that are beginning to go into a decline. In going through the Northwest it is surprising to find how many trees are going into a decline. You who are in your orchards from day to day don't see how your trees are going into this decline. Too many of your blossoms are small and too many are not setting fruit; if you could prevent that condition you would gain a whole lot. In many cases our soil conditions and methods of handling our trees are causing this early decline which we must take strong

Continued on page 28

FRUIT-FOG

Adds Thousands of Dollars
To Fruit Profits!

The Scientifically
atomized
SUPER-SPRAY
produced by
Hayes Sprayers

THE demand for Hayes Fruit-Fog Sprayers is steadily increasing. Owners of large commercial orchards, small owners and experimental stations find in this *superfine spray* the *final solution* to the problem of controlling those vicious, *hidden* pests and diseases which have heretofore *ravaged fruit crops* and caused *appalling loss*, in defiance of all heavy, coarse, low-pressure sprays.

If you want to reduce cider apples, wormy pears, scaly peaches and other unsalable fruit to the minimum, and market a big, profitable crop of clean, sound fruit this

year, investigate the merits of **FRUIT-FOG**—at once. And bear *this* in mind!—**FRUIT-FOG** uses less solution—saves waste, and is more quickly applied.

HAYES HAND AND POWER SPRAYERS

FRUIT-FOG is like a fog or mist. Its amazing results are due to its remarkable fineness and adhering properties—not to **FORCE**!

Fruit-Fog gives far greater capacity with the same size nozzle; saves time and decreases expense. Will not knock off leaves or flowers like heavy, coarse, low-pressure sprays.

FRUIT-FOG envelopes everything with a vapory fog of solution; filters into tiniest crevices in bark; gets under bud scales; beneath fleshy stamens of apple blossoms; reaches both top and bottom of leaves; roots out *hidden pests* that *no heavy spray can reach*! Perfect control is certain.

FRUIT-FOG deposits a light film of solution—enough to quickly exterminate all diseases and pests *without injury to the tree*. Being vapory no drops form and run off. This means a big saving.

Fruit-Fog requires only a small amount of solution. A season's saving in solution cost alone will amaze you.

FREE SPRAYING GUIDE

Gives important facts about successful spraying—when and how to spray, what solution to use for different pests. We will include interesting story of Fruit-Fog and complete 64-page catalog. Check and mail coupon at once.

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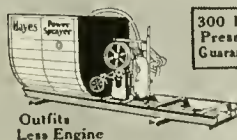
Hayes Power Sprayers are tested to 500 lbs. pressure and **GUARANTEED** to maintain 300 lbs. working pressure at full rated capacities. Each part has been especially built for constant operation at high pressure and many years of service. **HAYES HAND SPRAYERS** are built to give maximum pressure and capacity with minimum pressure to operate.

Choose from 50 Styles

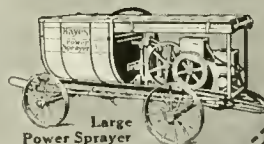
of large and small Hand and Power Sprayers for orchards, field-crops, shade trees, hops, poultry, painting, farm, home and garden use. Complete equipment or separate spray pumps, hose, nozzles, fittings, bamboo-rods, etc.

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300 Lbs.
Pressure
Guaranteed



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Pump &
Planter Co.**

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Spraying Guide, book on
Fruit-Fog and your 64-page
catalog of Hayes Sprayers.

I am interested in item checked:

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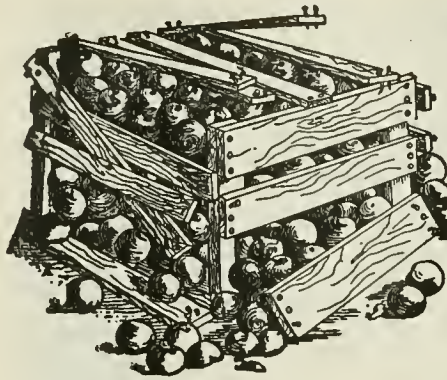
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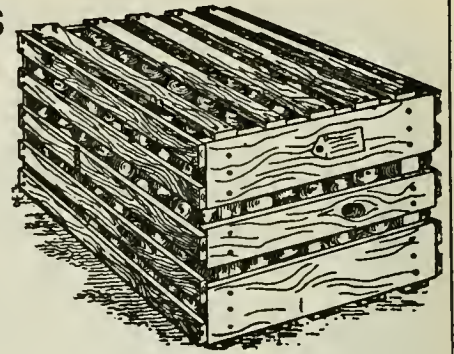
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Influence of Commercial Fertilizer on Bearing Orchards

By Gordon G. Brown, Horticulturist of the Hood River Experiment Station

SOME years ago and to some extent today a very serious yet comparatively simple soil problem forced itself upon the apple growers in various sections of the Hood River Valley. It had to do with vigor of tree and fruit production. Orchards formerly productive to a marked degree gradually began to fail. This was true not only of neglected orchards, of which I am glad to say we have but few, but also of orchards apparently (notice that I place emphasis upon that word) receiving the very best of treatment as judged by the standard practices of the time.

It did not require a person of highly trained horticultural ability to see that something was decidedly wrong. The trees not only showed that they were weak and devitalized, as evidenced by general appearance, but they gave striking proof of that fact in many ways. For example, terminal growth formerly vigorous and productive of fruit spurs was gradually giving way to weaker growths and in many cases was reduced to almost negative proportions. Fruit spurs formerly productive of plump fruit buds were now giving way to buds of an opposite character. The leaves formed were thin, small and sparse, and failing to function early in the summer were numbered with the windfalls. The yellow, almost reddish, appearance of the bark also served to indicate the true run-down condition of the trees, and in typical cases these characteristics could be noted at long distances across the valley, especially in the dormant season. A heavy crop of blossoms, weak in character and subnormal in size frequently appeared, but owing to their lack of vigor were unable to set and carry to full maturity but a small percentage of fruit. Fruit, while possessing good color, showed such high percentages running smaller than 150 to the box as to place it in the secondary market-value class. Coincident with these facts two general outstanding features regarding care predominated. The first was that previously no irrigation had been given; the second that long-continued clean cultivation had been the general rule.

The importance of the former is obvious and I will not deal with it here except to mention in passing that it is the serious intention of the Hood River Experiment Station to make a critical study of this practice under local conditions as soon as it is possible to do so.

Regarding the latter, it is now a rule long since established by agricultural practice the world over that clean culture practiced exclusively tends to destroy the organic matter of the soil. The relation of organic matter, humus, bacterial action, water-holding capacity and good tilth are widely understood. The relation of organic matter also to that all-important element, nitrogen, which makes for tree growth and production is also well understood but often not appreciated in a practical way. The soils in typically run-down orchards differed from that which I have just indicated in a marked way. They lacked water-holding capacity. They baked or puddled easily and on hillsides were much given to erosion. In some cases the organic matter was so badly depleted as to make the introduction of leguminous shade and cover crops such as clover and alfalfa, which depend primarily upon an abundance of moisture a matter of extreme difficulty.

Those in charge of this station in 1914, comprehending the true situation, began a series of co-operative fertilizer experiments in the Pine Grove district. Various brands of commercial fertilizers were used carrying the principal ingredients, phosphoric acid, potash and nitrogen. These were used under different conditions, in different amounts and combinations. A limited amount of barnyard manure was also used. The results to date are so clear and consistent as to point to the unmistakable correctness of the general principles given and show plainly that the mature apple orchard located on a silt soil such as we have here is certainly no exception to the general rule. Owing to the fact that practically no response has been secured from applications of potash or phosphoric acid and that the most consistent and satisfactory results have been secured from

nitrate of soda, I take it that a discussion of the latter work would be of most interest and practical value here.

For this work two typical Spitzenberg orchards about sixteen years of age were chosen. In both orchards four plots were laid out under as nearly uniform conditions as possible. These experiments may be considered duplicates in all respects other than in the amounts of nitrate applied. In orchard No. 1 5.6 pounds per tree formed the basis of the work and in orchard No. 2 6.7. Plots No. 1 in both cases received their fertilizer in the form of crystals broadcasted around the tree. Plots No. 2 in the form of a solution sprayed on the ground around the tree. Plots No. 3 in the form of a solution sprayed both on the tree and on the ground. Plots No. 4, as will be noted from the chart, have never received any fertilizer and will hereafter be referred to as the check. The cost of these application at normal prices, \$60.00 per ton, would amount to approximately \$10.00 per acre in the first case and about \$15.00 in the other.

During the first year the applications by the different methods were not all made at the same time. This fact served one very important purpose. For instance, it was learned that applications made in early March exerted a marked influence beneficially during the entire season on both tree growth and fruit production. On the other hand, the applications made in May failed to exert any appreciable influence until nearly the close of the growing season. Consequently, taking advantage of this information, the second applications were made in early March, 1915.

Now just a word regarding the general care given these orchards to date, because that is an important part of the program. Orchard No. 1 received its first irrigation in 1914. It was clean cultivated in the early season and seeded to clover and a good stand secured. In 1915 this shade crop was pastured by hogs and young cattle. In early spring, 1916, this crop with its manurial content was turned under. Orchard No. 2 was clean cultivated

during the early season of 1914 and later seeded to a mixture of clover and alfalfa. A good stand was also secured in this case. In 1915 this orchard received its first application of irrigation. The orchard is still in sod.

Now I believe I have given sufficient introduction to these experiments and the conditions prevailing to discuss results. Both of these orchards were decidedly unproductive for a number of years. The results show that no matter in what form nitrate of soda is applied that it exerts a marked influence beneficially to the trees in question. If there were any practical differences as between the different methods of application those facts were not established by any of the careful methods of checking up employed. The results were almost immediate. All of the fertilized trees became green and vigorous and yielded heavily, in marked contrast to the unfertilized nearby.

Let us be more specific and discuss yields. The chart shows this clearly and graphically. The yields per tree on a loose-box basis for the three fertilized plots in orchard No. 1 for 1914 are as follows: 4.1, .1, .2 versus .2 for the check. In orchard No. 2 the yields for the fertilized plots run as follows: 1.9, 2.3, 9.8 versus 2.1 boxes for the check. It is admitted that these yields are poor and that the results are somewhat inconsistent, but it must be remembered that both of these orchards were badly run down, that some irregularities with reference to time of application existed during the first year, and further, that no irrigation was given orchard No. 2 for that year. Turn now to 1915. The three fertilized plots in orchard No. 1 give yields per tree as follows: 8.1, 8.5, 6.0 versus .3 of a box for the check. Here we have an average increase of about seven boxes per tree. Next, turn to orchard No. 2 for last year. The fertilized plots give yields as follows: 10.0, 9.9, 10.1 versus only .9 of a box for check, an average increase of about nine boxes per tree, or about 1000%.

Another important feature of this work considers the character of blossoms and the percentages of fruit set. On all the plots receiving nitrate of soda the number borne to the spur was considerably more than on the checks. They were also much larger and more highly colored. The few blossoms appearing on the check plots were not only small in comparison but almost devoid of color. Many of the buds did not open. In both orchards percentages in regard to the set of fruit were taken both in June and again at picking time. Blossoms retaining at least one fruit each were credited with 100% set. With this in mind, turn to orchard No. 2 for 1915. Figures show that the fertilized plots in June retained between 70% and 80% of all their fruit as against only 35% for the check. During the remainder of the growing season these percentages were reduced approximately one-half. However, the ratio I have given you, two to one, remained constant during the entire growing season.

The grower of a fancy Spitzenberg realizes that it is necessary to produce fruit of good size. He appreciates that the trade is willing to make some concessions as far as color is concerned, providing sizes do not run below 138 to 150 to the box. Beyond that point it is necessary to secure about 90% red color in order to pass muster as first-class fruit. With this point in mind let us again turn to orchard No. 2 for 1915. For this work the fruit was graded to three different sizes: 175 to 150 to the box, 112 to 138, and 100 or larger. These may be classed as small, medium and large. It is significant that the check showed as high as 76% of all its fruits running as small or smaller than 150 to the box versus only 18% for the fertilized plots. On the other hand, the fertilized plots returned an average of about 50% large fruit versus only 5% for the check. Here we have two extremes of undesirability. High percentages of small fruit on the one hand and large fruit on the other. However, this last feature is not so serious when it is learned that all of the over-sized and under-colored specimens from the fertilized plots might have been thrown away and still the balance would have been vastly, yes about six or seven to one, in favor of the fertilized plots.

Let us refer briefly to vigor of tree. Here again figures bring out a good, strong contrast. In orchard No. 2 for 1915 there was an abundance of dark green vigorous foliage on all of the fertilized plots in marked contrast to the leaves on the check. Possibly it may be said that leaf development was slightly excessive in order to insure the best color of fruit, but here is the point I wish to show. The fertilized leaves averaged 2.8 inches long, or an increase of 24%. They were also 7% wider. These figures also substantially represent the figures secured in orchard No. 1 for the same year and also for orchard No. 2 for 1916.

Again, notice terminal growth. The chart shows the growth in inches on an annual basis for 1914 and 1915. It shows unmistakably which way the wind is blowing. These figures are important as they indicate quite closely the general vigor of tree. The figures for the fertilized plots for orchard No. 1 are as follows: 15.2, 11.4, 12.9 inches, respectively, versus only 6.9 inches for the check. In orchard No. 2 the figures run as follows: 8.4, 10.3, 10.9 inches versus only 6.6 for the check. An average growth of from ten to fifteen inches under these circumstances is admittedly good.

I believe that we may now well turn to results for 1916. Recall again, please, that no fertilizer was applied this year. We have seen what the influence of this fertilizer is. It is also apparent that during the past two years it has been applied sufficiently often and in as large amounts as we may safely do so. The question uppermost in our minds this year was: how long may the beneficial effects noted for the first two years be expected to last? Here

Continued on page 26

The Life of Chilean Nitrate Deposits A. D. 1917

Total Nitrate deposits in Chile	720 million tons
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Made Payable to

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of Congress of March 3, 1879.

The Ninety-Day Cold-Storage Bill on Apples.—A cold-storage bill has been introduced in Congress, known as Bill H. R. 18444, which would make it unlawful to store apples for a longer period than ninety days. Every fruit-grower, every shipping concern and everyone interested in the fruit industry, should sit up and take notice; get in touch with their respective Congressmen and Senators in each state, indicating to them just how this bill would be a menace to them in the Northwest and a hardship on the entire consuming public of the United States. Everybody that is interested in the fruit business in the Northwest should get busy and bring whatever influence and argument they can to bear on Congress in order that it may thoroughly understand this bill and the evil effect that would result. Because it is a reasonable assumption that if Congress thoroughly understands the effect of this bill on the apple industry and the consuming public, it certainly will not pass it. If apples cannot be placed on cold storage for a period of longer than ninety days it would mean that the balance of the crop which is unsold at harvest time, in the month of October, would have to be placed on cold storage in October and it would be unlawful for it to remain on cold storage after January. Consequently the crop of apples of the United States would have to be consumed, if people wanted it in prime condition, in about four months instead of seven or eight months. In other words, it would crowd the consumption of the entire crop into three or four months, which ordinarily occupies a period of seven or eight months. The result would be an immense supply of apples for half the season and practically no apples of good quality the other half of the season, a condition that would affect both the grower and the consumer very seriously. Apples when placed on cold storage remain at

a temperature of 32 degrees. It affects the condition or quality of apples in no way, simply arresting maturity. Winter apples in cold storage in prime condition will keep with comparatively small loss, commercially, for a period of six months. Apples placed in ordinary storage lose their flavor, aroma, spiciness and juiciness in sixty to ninety days, some varieties less. The only way this can be retained during the entire consuming period of winter months is by cold storage. Every fruitgrower knows this. The editor of "Better Fruit" placed eight boxes of Spitzenbergs and Newtowns on cold storage in the cold storage plant of the Hood River Apple Growers' Association about the first of November, 1915. Six boxes of these were taken out of cold storage and consumed during the months of March, April, May and June, being in absolutely first-class condition, without any commercial loss. Some of the Newtowns are still on cold storage in good condition, having been there for a year and three months.

The Pacific Northwest Tourist Association, recently formed, is an organization having for its object publicity of attractions to tourists throughout the Northwestern country. It is a well-known fact that many scenic attractions of the Northwest are unsurpassed, if equaled, by any other spot in the world. It is a well-known fact that California makes about as much money on tourist travel as it does from some of the biggest industries in the state. The object of the Pacific Northwest Tourist Association is to bring tourists from the East by the way of the Northwest. Already differentials in round trips, which in the past have prevented tourists traveling through the Northwest, have been overcome. With everyone working to assist the Pacific Northwest Tourist Association a large volume of traffic can be brought to the Northwest, from which everybody will profit. The Pacific Northwest Tourist Association is entitled to the support of everybody, publicly and privately.

Pruning.—The season is at hand when every fruitgrower should look to his winter pruning. Too many fruit-growers after harvesting feel justified in taking a rest, and when they get the habit of taking a rest they put off from day to day the winter pruning, until spring is near at hand, when other work commands their attention, consequently pruning has to go over until the next year. Pruning is a mighty important part of the orchard industry and should be done regularly and systematically, and not severely at any one time. A good pruning shears is an important matter with the fruitgrower who wants to do a good job and make clean cuts. Clean cuts are the only ones which heal over quickly, consequently the orchardist should supply himself with the best type of shears on the market, of which there are a number which can usually be found at the hardware or implement store.

1916 Prices.—The Bureau of Crop Estimates, Washington, D. C., issued on December 15th some very interesting data in reference to the apple crop. The crop in 1915 was 76,670,000 barrels of apples; the crop of 1916 67,695,000 barrels, about 15 per cent less of a crop. The value of barreled apples in 1915 was placed by the government at \$2.07 per barrel, and in 1916 at \$2.75 per barrel. In other words, barrel apples have 36 per cent higher value this year than last year. Business is better throughout the United States in general. Money is plentiful. The quality of apples in most of the Eastern States was below normal, poorer than last year. Nevertheless prices of barrel apples are higher. The strange fact in connection with these states is that box apples of the Northwest, which are better in quality this year than last and more perfectly graded, are selling for less money than they sold for last year. This subject merits investigation. The editor has some ideas on this subject, which will appear in future editions of "Better Fruit," but in this issue the editor would like to ask the growers, Why? "Better Fruit" would be pleased to receive letters upon this subject from any of the growers, selling concerns, associations, private shipping firms or selling. There must be a reason. What is that reason? "Better Fruit" wants information for the benefit of the apple growers. Upon receipt of the various opinions,—and it is hoped the growers, salesmen, etc., will write "Better Fruit" their opinions in reference to this matter, which is of serious importance,— "Better Fruit" will endeavor to analyze the situation and present results in as able a manner as possible for the benefit of the industry, without mentioning the names of the writers of any of the letters.

Gophers.—The gopher, forever in the past and probably forever in the future, will continue to be a pest and menace to the fruitgrower. In young trees frequently the gopher gets the whole tree. In old trees they frequently injure the green around the roots, which affects the bearing capacity of the tree. Gophers are particularly bad in orchards sown to cover crops like clover and alfalfa. This pest is something every fruitgrower should look after early in the spring, as they usually begin their work along about March or April. There are a number of good ways of getting rid of gophers. Many poisons are on the market which are very effective, and also some excellent traps which are sure to catch them.

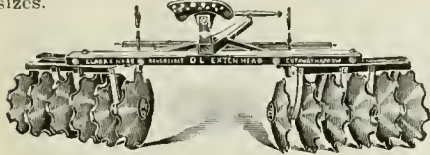
Ornamentals, Evergreens.—There is nothing that adds so much to the attraction of the fruitgrowers' home or tends to make life pleasanter or more attractive for the wife and children than a nice lawn, properly set with ornamentals, particularly evergreens, which are beautiful all during the winter. A nice lawn around the house is an important factor in giving value to the place if the fruitgrower should want to sell.

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so they would be right for service in this country. Our line is now complete. We believe it offers you the greatest value in this class of machinery that you can obtain anywhere and we will be glad to furnish you with information and prices upon anything used in growing fruit. We are able to show but a few of our leaders here. If they interest you, write for prices and information. If you are in search of something that is not shown here, write us. The chances are that we have it.

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We show here several styles of harrows that have made good in orchard service. In addition we carry J. I. Case and Roderick Lean Disc, spring and spike tooth harrows in all sizes.



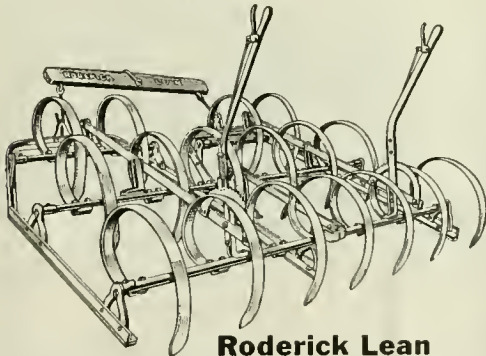
"Cutaway"

This is the famous original slotted disc harrow and is made in single and double action styles. The double action with its double sets of discs held rigid by its solid steel frame is undoubtedly one of the best tools ever designed for intensive cultivation. We have these Cutaway Harrows in special extension type for orchard work.



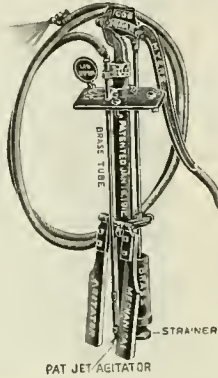
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This is the famous harrow that carries all the weight on broad tired wheels. It has long spring teeth that are made of extra high grade spring steel. Its construction is steel throughout, and we have been told by orchard men that they can cover much more ground and do a more thorough job with the Light Draft than with any other harrow they ever owned.



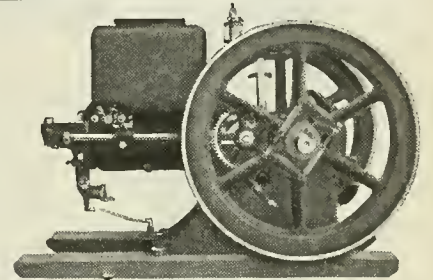
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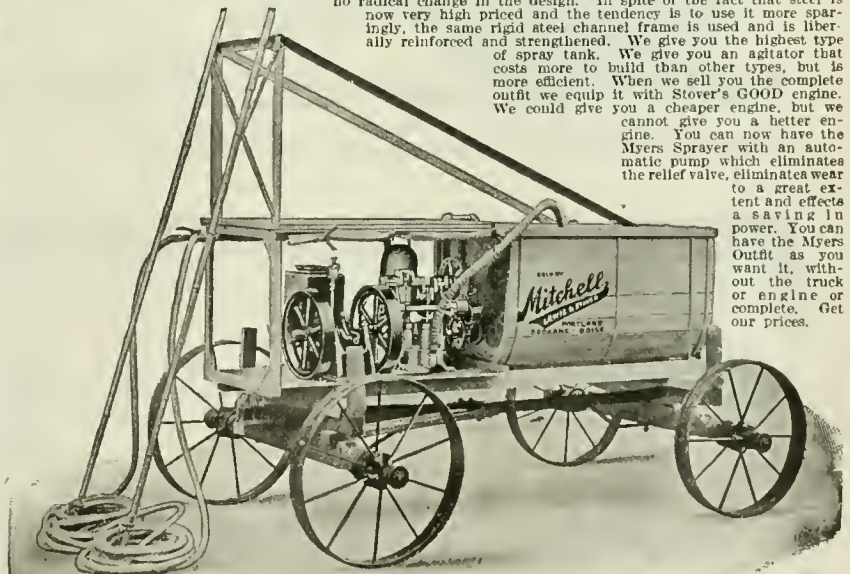
Spraying requires a power that is dependable. There is no service that makes such severe demands on an engine as does spraying. You want an engine that you can forget, so that all of your attention can be upon the work in hand. This engine is the Stover, the quality engine, the lifetime engine. We have this engine built in special sizes for spraying. Booklet sent upon request.

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We have stocked some low wheeled, short turn orchard trucks that are light draft and at the same time are substantial enough to stand the heaviest work. These trucks are to other trucks what the Mitchell Wagon is to other wagons. There is no comparison.

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Since the introduction of the Myers Power Sprayer there has been no radical change in the design. In spite of the fact that steel is now very high priced and the tendency is to use it more sparingly, the same rigid steel channel frame is used and is liberally reinforced and strengthened. We give you the highest type of spray tank. We give you an agitator that costs more to build than other types, but is more efficient. When we sell you the complete outfit we equip it with Stover's GOOD engine. We could give you a cheaper engine, but we cannot give you a better engine. You can now have the Myers Sprayer with an automatic pump which eliminates the relief valve, eliminates wear to a great extent and effects a saving in power. You can have the Myers Outfit as you want it, without the truck or engine or complete. Get our prices.



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There's but one Caterpillar—Holt builds it

Spray Equipment.—Experience in fruit growing, particularly apple growing, during the last two years, on account of the prevalence of codling moth and various other pests and diseases, has convinced the apple grower that, in addition to using the right spray material in the right way at the right time, it is absolutely necessary to have first-class equipment in the way of spray outfits in order to accomplish satisfactory results. Every mechanic knows better than to try to do a good job with poor tools. Every fruitgrower should have a first-class spray outfit for spraying. There are a number of good makes on the market. Every fruitgrower should give the matter prompt consideration and decide what kind of an outfit he is going to purchase and make the necessary arrangements for delivery.

Merchants' Week in Portland, February 19 to 24, will be the Eleventh Annual Convention of the Oregon Retail Merchants' Association. The object of this convention being to bring together jobbers, retailers and sales managers from all over the Northwest with a view to discussing and formulating plans that will stimulate the development of the Northwest and increase the volume of business being done, opening up a way for a larger sale of products of the Northwest.

The Fancher Creek Nursery Company, Fresno, California, announces they are sending out their new illustrated price catalog. This firm usually issues a very interesting catalog with considerable information to the fruitgrowers, as well as many specialty fruits which are grown in California and that can be grown in the Northwest.

Power Drag Saw does the Work of 10 Men



One man can move machine from cut to cut on log. Two men can carry it. Cuts through 3½ foot log in three minutes. Approximately 25 cords a day. 3½ H. P. gasoline engine warranted. Steel wheel cart \$8.00. Send for catalogue. MANUFACTURED BY


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Spraying.—The spraying season will soon be at hand for the early pests and diseases. The first pests and diseases on the program are aphids, scab, and San Jose scale. Spraying for San Jose scale is usually done when the buds begin to swell; spraying for aphids about the time the buds are ready to burst. Spraying for scab should commence with the semi-dormant spray, which is when the buds begin to burst and show small green leaflets. Spraying for these pests and diseases usually commences in March. This edition contains an interesting article on spraying for aphids; the March edition will contain information about spraying for scab and San Jose scale.

The Cow and the Hog.—"Better Fruit" has published a number of articles in previous editions in reference to the cow and the hog in connection with orcharding. Now that fruitgrowers have found that through continued cultivation they have depleted the soil of humus and nitrogen, and have found further that this can be supplied with cover crops, the way is open for the fruitgrower to make some extra money without extra expense by seeding his orchard to cover crops, sowing alfalfa or clover and maintaining a few dairy cows or a drove of hogs. A number of fruitgrowers who have done this are making some extra money, which comes in handy throughout the year.

The Spray That Sticks



ADHESO

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Insecticide, Tonic Fungicide

**"ADHESO" HAS PROVED UP IN
THE WEST**

G. I. Aiken, Placerville, Cal., writes:
"I have Winesap trees that for the last ten years have been so Scabby that I was thinking seriously of digging them out. However, I decided to try once more, this time using your 'ADHESO,' and the result was that I had over 99% clean fruit."

Mr. Aiken has re-ordered.

The Wonderful Apple Crop of W. D. Shoupe, written about in the November 15 issue of "The Fruit Grower," was sprayed with 1800 lbs. of "ADHESO." Mr. Shoupe has ordered 1800 lbs. for 1917 for his Sandoval, Ill., orchard. The Largest Apple Crop Ever Grown by a Single Grower was sprayed with our "Triangle" Brand Arsenate of Lead. John W. Miller, Martinsburg, W. Va., grew this year 45,000 barrels, valued at \$150,000. All Sprayed with Our Sprays. Mr. Miller has placed his entire order with us for 1917.

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Spraying Lemons Near Santa Paula, California.



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Spraying Grapefruit in the Atwood Groves, Florida.



A Bean at Hawkesbury Agricultural College, Australia.

In the orange-growing sections of the Transvaal, South Africa—in the lemon groves of Southern California—in the vineyards and fruit-growing sections of old New York State—in the grapefruit groves of Florida—in the orchards of Australia—wherever fruit is grown and spraying is required there you will find the Bean at work. Bean outfits are

Noted for Downright Dependability

There are 30 years of experience back of the Bean line—30 years of steady improvement and constant betterment. They have many distinctive, important advantages—many of them found on no other outfits. We call your attention especially to the following:

BEAN PATENTED AUTOMATIC PRESSURE REGULATOR—which ends all safety-valve troubles. Absolutely safe and certain. When nozzles are shut off, the liquid is simply pumped back into the tank, without being put under pressure. Saves fuel and much wear and tear on engine and pump.

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PORCELAIN-LINED CYLINDERS—cannot be injured by any liquid.

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We make a complete line of Power Sprayers at from \$100.00 up—as well as Hand and Barrel Pumps, Nozzles, Hose and all Pump Accessories.

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Name

Address

The Satisfactory Vegetable Garden on the Fruit Farm

By A. G. B. Bouquet, Division of Horticulture, Section of Vegetable Gardening, Oregon Agricultural College

WITH the hurry and scurry of every-day activities on the fruit farm, the vegetable garden, as a legitimate part of the farm, very often suffers from lack of attention, or in many cases it is entirely an unknown quantity. In still other cases it has fallen to the lot of the housewife to also do a large part of the vegetable gardening, in her attempt to produce some fresh produce that she can prepare for the table for the hard-working fruitgrower. It seems almost unnecessary to emphasize that this is somewhat of an unreasonable proposition in view of the amount of work that the average housewife on the farm must necessarily do from day to day.

It has always been my impression, gained by observation and experience, that the average farmer realizes to a small degree the producing power and money value of a small area of land cultivated to vegetables. Indeed, on a great many farms it is the last part of the farm that receives attention, the farmer laboring under the idea, presumably, that either the vegetables will grow anyway without very much care or that there was not enough return made in the time invested in the care of the same.

I well remember a few years ago my first attempt to interest and influence

the average Hood River Valley farmer and fruitgrower in the value of the garden area. These attempts seemed to be crude and rather wasted on the desert air, but succeeding years have shown, I believe, that at least some of the seed may have taken root and while not producing a hundredfold, have provided some examples which were later to influence others. It is not so very long ago since the situation was when many of these fruitgrowers in this section as well as in others were purchasing in liberal quantities their everyday necessities, among them many vegetables. Not a few crates of the most common kind of vegetable produce found their way down this valley and other valleys to be finally disposed of to some farmer.

My impression is that this condition has somewhat changed at the present time, and I am led to believe so partly by the increased interest taken in some of the meetings at which I have spoken, and the statements made to me by a goodly number of folk who have related to me their successful experiences, as well as their difficulties in the farming of their vegetable lands. Others, possibly, have made feeble efforts and have had very little success. These are often ready to condemn the feasibility and value of the garden area, offering as an excuse that it does not pay to cultivate the land to these kind of crops. It should not, however, take very many years to convert these people to the true light of conditions.

I believe that no farmer can afford to so specialize or be so wrapped up in one crop or another that he neglects to produce some of the daily necessities of life. For economy and health he should have a vegetable garden, and a satisfactory one, which returns to him a profitable interest on his time, labor, and money invested. That is the problem, and the basis of my discussion.

Many vegetable garden areas on the farm are too large. They cover too much ground, and one has to cultivate and attend to an undue amount of soil. I would suggest no larger an area, outside of the potato acreage, than a plot one hundred by one hundred and fifty, or even fifty by one hundred and fifty, laid out for horse cultivation, so that there is the greatest economy in the working of the land.

Many gardens begin to be failures almost before they are started, because they are attacked suddenly, on the spur of the moment, without any plan, or much forethought. A farmer should have a plan of work and then work his plan. It doesn't have to be elaborate or intricate, but it is a guide to operations, and I assure you it is as good and as valuable as an architect's plan in building a house. The Oregon Agricultural College would be glad to submit to farmers suggestive plans for their home vegetable garden. By writing to the Department of Vegetable

Gardening these may be obtained. I have seen hundreds of home gardens with altogether too much of one variety planted, and not enough of another. Similarly, there are many gardens where this or that vegetable runs out, and there is a situation of too much at one time and nothing at another time. This can be very largely avoided by planning the plantings and making them timely and opportune.

I recommend a wider variety of crops to be grown in the farm garden, without necessarily entailing much added labor or expense. By this I wish to encourage a larger variety and a more satisfactory variety of vegetables produced and eaten. Variety is the spice of life, and no farmer should be without some of the more delicious vegetables that the city folks have that can be produced at least on the average farm. In this connection we would do well to pay more attention to vegetables and their adaptability to seasons of the year. By this I mean that it is entirely possible to lengthen the production and the value of the garden by planting crops for the fall season, the winter season, and for early spring. Such vegetables as Swiss chard, Scotch kale, brussels sprouts, spinach, broccoli, Danish cabbage, and head lettuce, ought to be grown more, for these are

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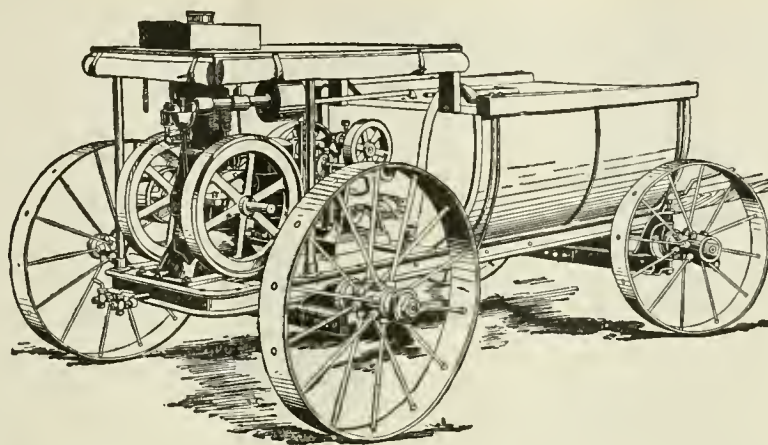
A married man, now with Washington State Department of Agriculture, a thoroughly practical orchard man, who can put the balance on the credit side of the ledger, wants to take charge of an orchard. Will consider part salary and part percentage of net receipts. I offer the best and expect the same.

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Combines in one smoothly running powerful machine all that the most exacting fruit raiser demands in adaptability to any orchard condition—pressure, pump capacity and economy of operation.

The special all steel underslung truck goes anywhere. Side hills and bad soil conditions are conquered. Its rocking bolster and low center of gravity keeping an even load on rough ground. Closely set orchards are thoroughly and quickly sprayed without usual damage to fruit or trees. Its powerful well balanced engine, built with the same skillful accurate workmanship as an automobile, provides an ever ready source of power, one which is always on the job, willing and sturdy, yet so well designed and constructed that its fuel consumption is the lowest.

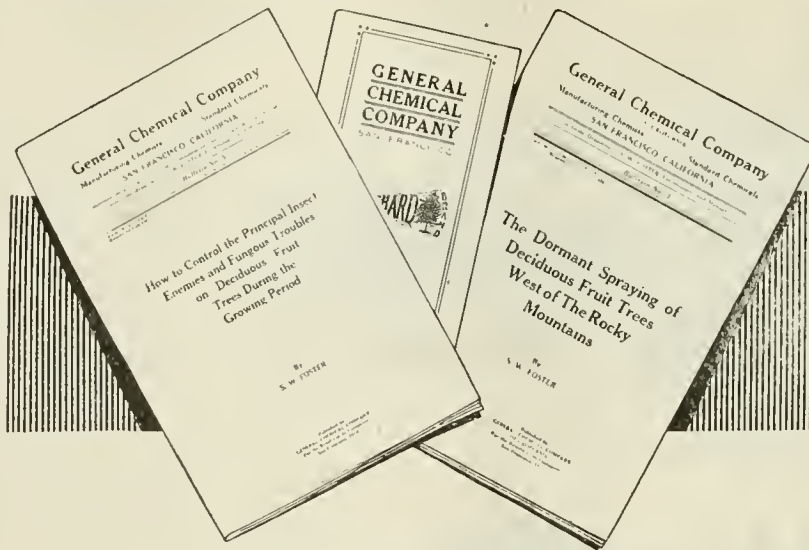
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If you have any orchard diseases or pests write to Mr. Foster, giving him a full description of the conditions and he will tell you what to use and how to use it.

Orchard Brand products can be obtained from the following:

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C. J. SINSEL, Boise, Idaho.	SAMUEL LONEY & CO., Walla Walla, Washington.
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Mail the Coupon to Dept. F-3

General Chemical Company, San Francisco, California

Insecticide Department, General Chemical Company,
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Please send me free bulletins regarding the control of orchard pests and diseases. I have

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Name

Address

all hardy vegetables and mature at a time when other goods are gone. Too many gardens are over by the time the first cold snap appears.

I recommend also a careful and discrete choice of varieties of each vegetable. Our seed catalogs are loaded with the same, but the wise gardener picks the best stuff from experience or suggestion, the choice being made on the basis of quality, adaptability to season, and maturity. To illustrate, for a hardy fall and winter head lettuce, New York is the best. It is not so adaptable in the summer time. There should be at least two or three varieties of sweet corn planted, some for early, some for mid-season, and some for late. For instance, Portland Market for early, Golden Bantam for second early, and Howling Mob to be planted for the later season. Successional plantings of these various varieties would no doubt suffice. My best corn this year was planted July 6th to the 12th, and was in fine condition toward the middle of September. The proper choice of varieties of every vegetable makes a big difference in the success or failure of the home vegetable garden.

Satisfactory vegetable gardens are never grown from indiscriminately bought seed. On the contrary, it pays to get the best, of the highest quality. This should be ordered early in January, before stocks begin to get low, and possible substitutions are made. Ordinarily, I do not think it is necessary for any gardener to get "stung," so to speak, on his seed purchasing, unless he buys with his eyes shut, and with but little care. Acclimated Oregon vegetable seed is a big factor in our gardening, and will be more so in successive years. Keep your money in the state and patronize home industry. Don't send it to the Middle West or East unless you have to. There is a lot of good vegetable seed grown here in the state, and offered for sale by our seedsmen. I think that the fruitgrowers should be encouraged to practice more than they do the purchasing of Oregon-grown seed.

One of the essential features of a satisfactory garden is the equipment, which is efficient, but not expensive, of some glass sashes, a wooden frame, some horse manure, providing a temperature of 120 to 140 degrees Fahrenheit, and some dry straw or burlap, in which to produce in the spring the young vegetables for later setting in the garden; also in which to have head lettuce and radishes growing out of season months of the year; also in which to force a little early rhubarb, possibly; in which also to grow melons, eggplants, and peppers in districts where these otherwise might fail to mature. All this could be purchased for the sum of \$7.50 or \$8.00, and it would last ten years or more. The average farmer makes little use of the hotbed or the cold frame, and this is the essential feature of our home gardens, at least in the Willamette Valley, that is lacking for want of the knowledge of the value and use of the same

by the average farmer. There are but few Thanksgivings and Christmases that I do not eat a few heads of New York Lettuce grown in the frames for my dinner, while other folks are spending picture-show money for theirs. In districts such as the Hood River Valley, where in some parts the growing season is not long, and the average daily and night temperature is not high, a great deal of value for plant and crop protection is the small forcing hill, or individual cold frame. There are many styles of these that can be used, but they all have the same principle and use. Place these at night over your tomato plants, your eggplants, your pepper plants, your melon and cucumber hills, and your garden will not succumb to the unusual cold nights. Considerable use of these is made by gardeners in the vicinity of The Dalles, for plant protection, as a means of increasing the earliness of their crops. It will be necessary also in this district to use added protection in the form of straw mats or dry straw, or old carpet material, in order to keep the cold from penetrating the glass sash.

The perennial vegetables, such as asparagus and rhubarb, are important in the home garden, because they are early, easily cared for, and permanent. Fifty to seventy-five plants of asparagus, and ten to twenty rhubarb plants, will furnish a sufficiency for the average family.

One of the most widely-eaten vegetables is head lettuce. It is likewise found but little in the average home

garden during the entire season. Lettuce that is solid, sweet, and tender, can be grown in most sections of the state, and in many sections nine and ten months out of the year. Success in growing this vegetable depends upon the right selection of varieties, timely applications of water, and plenty of manure in the soil. The average farmer can also have a good supply of lettuce grown in the cold frames during the late fall and early winter, and also in the early spring before the outdoor crop begins to head.

The equipment of four glass sashes in a cold frame, together with the lumber of the frame itself, can be paid for by growing one crop of lettuce under these sashes. In a frame 12 feet long and 6 feet wide, 144 lettuce plants can be planted. These should sell at least at 50 cents a dozen, which would make a total of \$6.00, which would go quite a long way toward paying for the original cost of the equipment. There should be no need for the fruitgrower to buy his Thanksgiving celery, and oftentimes his Christmas celery. He can grow it out of doors, partially blanch it, and when cold weather comes, store it in the barn or shed which is reasonably frost-proof. This is especially possible in districts where the falls are cool and where there is not so much moisture as there is in the western part of Oregon.

Storage is a feature of vegetable gardening that is very important. Various vegetables can be successfully stored for winter use, such as cabbage, celery, roots of all kinds, squash, pumpkins, and onions, and these, together with the canned products, which are usually put up, such as string beans, tomatoes, asparagus, sweet corn, etc., should make things decidedly easier for the cooks during the winter time, and furnish a more pleasant variety for the farmer.

I fully realize the difficulties in vegetable gardening, in endeavoring to con-

trol insects and diseases. Yet at the same time there are many of these that can be controlled by a discrete use of the right measures at the correct time. It is unnecessary for a gardener to lose a number of his plants from injury by a certain insect, while others are relatively more difficult to successfully control. Truck gardeners, as well as fruitgrowers who are growing vegetables, can always obtain some very helpful information by writing to the Department of Entomology of the Oregon Agricultural College.

In regard to the fertilization of the home vegetable garden area, I would say that it would pay you to save from your own stock, your horses or cows, enough manure so that you can put on 250 pounds per square rod of garden area. If this is impossible, use 20 pounds of lime, or one-half that amount of land plaster, and five pounds of complete commercial fertilizer to the same area.

There are many other important factors of successful vegetable gardening that I might emphasize. One of these is the necessity of some regular or systematic time being devoted to the vegetable garden. If this part of the farm is given its due care, it will show a greater balance of net receipts for the given amount of area cultivated than almost any other part of the farm which is tilled.

Space and time forbid my going into details to any further extent. I would like, before closing, however, to emphasize to the fruitgrowers and members of the society here present that the Vegetable Gardening Section of the Division of Horticulture of the Oregon Agricultural College is anxious to serve the fruitgrowers of the state as far as possible by assisting them in the cultivation of their areas devoted to vegetable gardening. Any communication I receive will be very carefully considered and as much assistance as possible rendered.

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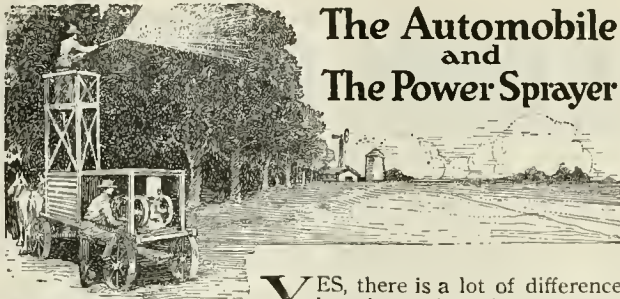
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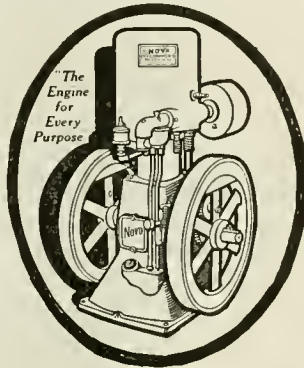
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The engine of the sprayer must deliver steady, unfailing power as the machine moves along over rough spots, on hillsides, across ruts.

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Influence Commercial Fertilizers

Continued from page 17

we have a quick-acting fertilizer, and owing to its greatly soluble nature it is assumed that none of that applied in 1914 or 1915 would hold over in the soil to influence the action of the soil for 1916. It was also assumed that owing to the greatly improved physical condition of the fertilized trees that the beneficial effects would be lasting for some time, and what we wished to determine was to what extent this might be so.

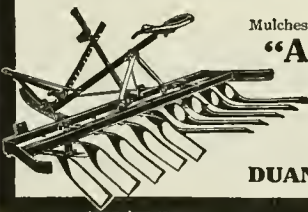
In this respect we were not in the slightest disappointed. All of the fertilized trees came up to our fondest expectations. In orchard No. 2 there was a uniform blossoming on all of the plots. Notes taken this year closely approximated those of former years. Again turn to terminal growth. We have seen the average for the first two years. Notice that of 1916 as given in inches. They are as follows: 15.4, 8.4, 14.7, respectively, for the fertilized plots versus only 5.2 inches for the check. Note that the fertilized average is improving and that the check continues to decline.

Next notice yields in this orchard. The fertilized plots give yields as follows: 14.8, 15.5, 15.7 boxes, respectively, versus only 5.7 boxes for the check. Even were we to take on a three-year average the poor results for 1914, which would hardly be fair owing to the fact that no irrigation was given and that irregularity regarding application of fertilizer existed, we would still have averages as follows: 8.9, 9.2, 11.8 for the fertilized plots versus only 2.9 boxes for the check. Surely these are results we are all pleased to see.

Turn once more to orchard No. 1. Here, as will be noted, yields are good, but strong contrasts are lacking. The difference between the fertilized plots and the check is not large, but it does stand out strong on a three-year average. Note also that the terminal growth of 19.9 inches on the check slightly exceeds two of the fertilized plots and is approximately equal to the third. What has been the cause. It is easy to dismiss the subject by saying that trees which have produced little fruit for a number of years should begin to show form pretty soon. But in my judgment that explanation is somewhat unsatisfactory because I believe we have a better one. It is also worthy of note that unfertilized New-towns of same age in this same experiment about which I have said nothing as yet produced on an average of 13.3 boxes per tree, only one-half box behind the fertilized trees. I have made a careful study of this orchard during this past summer when differences are most marked and in a general way can say that there is little to distinguish between the different plots except the stakes marking the same.

It will be recalled that this orchard was seeded to clover in 1914 and a good stand secured, that it was pastured by hogs and cattle in 1915 and this cover crop turned under in 1916. I take it

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that owing to former soil conditions and the long years of clean cultivation given, which destroyed practically all of the organic matter of the soil, that the reintroduction of organic matter in large quantities, largely explains the apparent inconsistency between results in orchard No. 1 and orchard No. 2.

Looking at the subject from an unprejudiced standpoint these are facts we want to know, because there is an abundance of just such information going to waste all around us and should become common knowledge. Oftentimes an experimenter starts out to prove a definite preconceived idea regarding orchard fertilization, and if his vision is sufficiently narrow and his determination sufficiently great he usually collects enough data to prove his case. In my judgment these facts relating to orchard No. 1 in no wise minimize the importance of results secured in orchard No. 2, or in orchard No. 1 as far as that is concerned. They simply throw additional light upon the whole subject of orchard fertilization and compel us to look at the problem not from the standpoint of commercial fertilizers alone but also from the viewpoint of many other factors affecting the soil and which enter into the production of high-class fruit.

What are the conclusions we may safely draw for the average grower from work of this kind. First, I would say reservedly, "Don't be too enthusiastic." Now, that should mean a great deal to a body of trained horticulturists such as you. There is a very delicate balance existing in the tree between fruit production on the one hand and wood production on the other. Either, pushed to extremes, is accompanied by failure. It is obvious from the figures herewith presented that it is easily possible to overdo the whole thing.

Again, I have explained what were the governing factors which led up to the problems I have just discussed. Recall that owing to the years of clean cultivation given organic matter was practically depleted in the soil. The logical and sensible thing to do under these circumstances is to restore this organic matter as quickly as possible and thereafter maintain it in sufficient quantities to prevent a recurrence of the trouble. This fact should be constantly uppermost in your mind, that while nitrate of soda can very greatly improve the physical condition of the tree it cannot do the same thing for the soil. The greatest benefit to be derived from its use lies in the fact that it is a quick-acting fertilizer and enables the grower to tide over periods when the demands upon the soil are sufficient to justify its use. That it is a cheap fertilizer in normal times is also another factor of great importance, but in my judgment it will never be able to compete with that form of nitrogen which may be fixed and maintained in the soil by the judicious use of shade and cover crops. That it has been a great factor in covering a present need is obvious. Just what part it will play in a definite rotation in this valley should one become established

is a matter of conjecture, and time only can tell. In my judgment it will always play an important factor in high-class

fruit production in the Hood River Valley and possibly elsewhere where similar conditions prevail.

Orchard No.	Plot No.	Pounds per Tree		Treatment	Yields, Loose Boxes				Terminal Growth Inches	
		1914	1915		1914	1915	1916	Avg.	1914-15	1915-16
1	1	5.6	5.6	Clover manure	4.1	8.1	13.0	8.4	15.2	20.1
1	2	5.6	5.6	Clover manure	0.1	8.5	14.8	7.8	11.4	17.1
1	3	5.6	5.6	Clover manure	0.2	6.0	9.6	5.3	13.9	16.1
1	4	No fertilizer	No fertilizer	Clover manure	0.2	0.3	8.8	3.1	6.9	19.9
2	1	6.75	6.75	Sod.....	1.9	10.0	14.8	8.9	8.4	15.4
2	2	6.75	6.75	Sod.....	2.3	9.9	15.5	9.2	10.3	8.4
2	3	6.75	6.75	Sod.....	9.8	10.1	15.7	11.8	10.9	14.7
2	4	No fertilizer	No fertilizer	Sod.....	2.1	0.9	5.7	2.9	6.6	5.2

The Southern Pacific Railway has issued special low round-trip rates to all Southern California points. There is no place in the entire United States more delightful in winter time, either in climate or scenery, than Southern California.

The 1917 Rpple Crop.—On account of the very heavy apple crop of 1916, it is fair to assume in advance that the 1917 apple crop will be much smaller. It is a matter of fact and record that heavy apple crops do not follow each other two years in succession.



Frank Dorr, Wasco, Cal., and his J. H. Hale Peaches, from trees planted in 1914

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This really wonderful peach is particularly suited to the requirements of Pacific Coast growers. It will ship safely to most distant markets and will bring the highest prices in competition with the best commercial varieties. It combines all of the good money-making points of the best commercial varieties, and has them to a greater degree. It has better color, is more dependable bearer, averages a third to a half larger and will outship any of them two to one. Read Mr. Hale's Own Story in our catalog—how he tested it for over eight years before he was willing to give it his name. Since then it has been planted and tested in a large way by leading peach growers in all parts of the country. They say "Mr. Hale was too conservative in his description"—that "he didn't tell half the story." Let us send you reports of growers in nearly every state who have fruited this great peach. Send for our free catalog.

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"Your trees are the hardiest, best rooted stock we receive, well packed and in good condition. Were I to order trees for myself, I would order them from your nursery."—H. B. M. Hall, Quarantine Inspector, California.

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It tells how to plant, prune, spray, cultivate, etc. Endorsed by beginners and experts. 10c per copy—Free with \$2 orders.

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Tells how to make your own plans for planting to add attractiveness and value to your property. 10c per copy—Free with \$2 orders.



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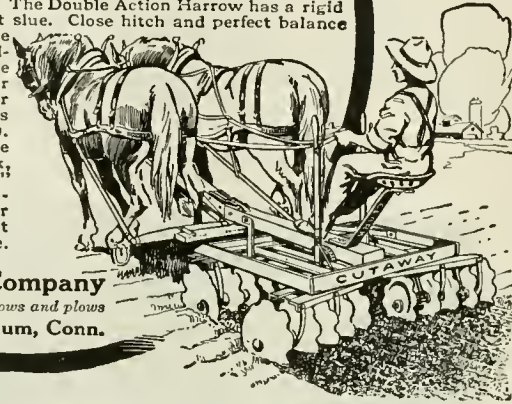
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It cuts, fines and levels the soil. The Double Action Harrow has a rigid main frame so rear disks can not slue. Close hitch and perfect balance make the draft light. No tongue truck needed. Bearings of hardwood soaked in oil. Forged edge disks. There's a CUTAWAY for every purpose and a size for every farmer. The best dealers handle the CUTAWAY (CLARK). If you cannot get the genuine write us direct. Our book, "The Soil and Its Tillage," will show you how to unlock the plant food in your soil. Send a postal for it today—the book is free.

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Maker of the original CLARK disk harrows and plows
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Influence of Winter Pruning

Continued from page 14

steps to prevent. Winter pruning is only one of the factors which will aid you.

Professor Morris: You spoke of the pruning at the time trees are six or seven years of age being generally too much. People get in the habit of pruning young trees in order to develop stockiness and they get the habit. I believe a very great amount of tree growth and tree vigor and orchard finance is lost in excessive pruning from the time the trees are set until in full bearing. I believe very, very many people in every fruit-growing district of Washington have become over enthusiastic about heavy pruning and that they have lost very seriously because of it.

"My Story of Securing Fruit Bud Development by Summer Pruning," L. A. Pennoyer, Hamilton, Montana. You can't have too many fruit spurs on a tree—the more the better—but you don't have to use them all the same year. You can use one set one year and another set the next year so that you continuously have heavy crops of fruit. To get a great number of fruit spurs top in heavy in the winter to start with. That will make the tree throw out water suckers. Little limbs will come out from the crotch of the tree up. We stub these back to one, two or three inches and form fruit spurs out of those. In fact they will make fruit spurs all the way down the scaffold limbs. About the first of August when the terminal buds start to form we stub these in. This is our summer pruning. By stubbing all this excessive growth back is where we get our fruit spurs. In fact you get so many fruit spurs you don't know what to do with them. Young trees always bear large fruit; old trees will do the same thing on young wood. Our winter pruning consists in topping back every year, which throws thriftiness into the tree and also into the spurs. By this method when a tree gets into bearing it will hold up an enormous load without breaking down. Don't let your trees get old. You have got so many fruit spurs you can spare some. Cut clear back to the limbs and new spurs will come out and you will get new wood again.

Question: What is the age of your trees?

Mr. Pennoyer: From four years old up to twenty.

Professor Morris: On the trees twenty years old what is approximately the greatest length of extensional growth, the average of the season's growth in the top?

Mr. Pennoyer: From two to three feet up to forty inches.

Question: What varieties do you grow?

Mr. Pennoyer: Wealthy and McIntosh, although we have Spys and Ben Davis.

Question: What do you consider a good yield from your older trees in the number of boxes per tree?

DOW ARSENATE OF LEAD PASTE

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AMERICAN GROWN—Apples, Japan and Kieffer Pear Seedlings. **IMPORTED**—Pear, Plum and Cherry Seedlings, Quince and Rose Stocks. **GRAFTS**—Apple and Pear, any style. **LARGE ASSORTMENT**—Fruit Trees, Small Fruits, Ornamental Trees and Shrubbery, Roses, Vines, etc.

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Mr. Pennoyer: Our McIntosh trees, fifteen years old, this year averaged eleven, twelve and thirteen boxes.

Question: How many trees to the acre?

Mr. Pennoyer: One hundred.

Professor Morris: What time do your trees blossom?

Mr. Pennoyer: The Bitter Root Valley comes in almost any old time from the first of April to the first of June. There is also great variation in the time of the first killing frost.

Professor Morris: Your season is very short, from 100 to 160 days frost free.

Mr. Pennoyer: Our trees blossom as late as the 10th of June and mature a fine crop of apples.

Mr. Van Marter, Opportunity, Washington: In thinning do you take blossom or fruit entirely off from the spur?

Mr. Pennoyer: After the fruit gets through falling we take the fruit entirely off every other or every third spur. Those spurs will give the crop next year.

Question: Do you prune all varieties the same way?

Mr. Pennoyer: We work mostly on the McIntosh and the Wealthy. The Spy does not bear heavily with us, but this year, by these methods we got a heavy crop of Spys.

Question: How old are your Spy trees?

Mr. Pennoyer: Eleven years old. Never got a decent crop until this year when we got about two-thirds of a crop.

Professor Lewis: The Spy does not come in much before eleven years. The Wealthy and McIntosh bear on spurs and terminal buds; you don't have to depend on the spurs alone in those varieties for the fruit. With the Spy you have got to depend on the spur almost entirely. There is probably no variety that beats the Wealthy to bear on year-young wood.

M. L. Dean, State Horticultural Inspector, Missoula, Montana: I want to explain that in the Bitter Root Valley we have a different range of soil and a different growth of trees from most of you. Our soil is mostly disintegrated granite and does not produce as strong a growth as your soil does and that permits Mr. Pennoyer to handle his trees differently. I have visited this orchard and think he is the only one that follows this system of pruning and we all know that he is a radical pruner, but he gets the results just the same. When we want some McIntosh apples to send away to a fair to take a prize we go to Mr. Pennoyer's orchard to get them. Since starting this system of pruning he has described, heading back and developing that fruit-bud system, the limbs of his trees are one solid line of fruit.

C. C. Vincent, University of Idaho: I presume some of you remember that two years ago I prepared a paper on summer pruning giving the results of experiments we had made over a period of five or six years. Our conditions at Moscow are somewhat different from yours. Our elevation is 2,000 to 2,500 feet with 24 inches of rainfall, so that

Speaking of Arsenate of Lead

*One of the largest and most thorough
orchardists of the entire West says:*
(Name and address on request)

"Have made tests of practically all other brands, but have always returned to Grasselli with considerable satisfaction because:

"First—It remains in suspension better than others.

"Second—It leaves no residue in the tank.

"Third—It seems to stick to the fruit, while other brands seem to wash off.

"Fourth—It kills the worms.

"It is almost impossible to find a wormy apple on any of my ranches. Less than 1% will cover all my losses in that respect."

IT WILL DO YOUR WORK EQUALLY WELL.

Twelve years of unvarying, successful and satisfactory use throughout the Northwest. Always uniform, dependable and effective.

The Fruit Growers' Standards:

Grasselli Arsenate of Lead Paste
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of this bank is to provide a progressive, helpful banking service to its depositors, regardless of the size of their accounts. We hope you will use that service. Put it to the test.

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LATIMER'S DRY

POWDERED ARSENATE OF LEAD

For eight years we have been specialists in the manufacture of Arsenate of Lead, but we were surprised when during 1916 over 80% of the orders we received were for Latimer's Dry and less than 20% called for Latimer's Paste.

Powdered arsenate of lead marks the greatest advance that has been made in spraying materials in the last ten years, and this has been quickly recognized by the growers.

If you use LATIMER'S DRY once you become an enthusiastic advocate.

Last season LATIMER'S DRY made its introductory bow to the apple growers of the Northwest and met with instant success in every district where it was used.

One large orchardist writes from Washington: "I am more than well pleased with my results after using Latimer's Dry. I have had less wormy fruit this year than I have ever had in all my experience and I am willing to give the credit to your lead."

We want to convince you this year that in a season's use LATIMER'S DRY is

MORE CONVENIENT
MORE EFFECTIVE
MORE ECONOMICAL

than any paste lead you have ever bought.

Ask your dealer for LATIMER'S DRY arsenate of lead or write to

The Latimer Chemical Company
Grand Junction, Colorado

we couldn't irrigate. Two years ago I made the statement that we had during the course of our experiments materially increased by the practice of summer pruning the yield and also secured higher color to our fruit. The experiments as originally planned were to take a block of trees planted in 1905 and give them nothing but winter pruning and to set aside another block to which only summer pruning was given.

Following are the figures showing the average yield in pounds per tree for 1916:

Variety	Winter Pruned, lbs.	Summer Pruned, lbs.
Jonathan	239.4	272.1
Grimes Golden	197.0	108.3
Rome Beauty	105.7	160.6
Wagener	177.4	215.5
Extra Fancy	35%	65%

With the Grimes Golden we were able to get a decided increase in the summer-pruned plot in 1914. The crop was especially large all over the trees and we made the mistake of not thinning enough. That threw us off on the summer-pruned lot again this year.

Our system of summer pruning was this: The trees were shaped after the tree growth had stopped, which is usually after the terminal buds set, but this varies from year to year. This year we didn't get at our pruning until the first of September on account of the season. I believe the results from summer pruning will depend almost entirely upon the time at which the pruning is done. If you prune too early you will get a secondary growth of wood, which shouldn't happen in a bearing orchard. Our winter-pruned trees we prune in the same way and shape up the tree from the time it is planted. Up to the time the trees come into bearing we prune, thin out and shorten back; after the trees come into bearing we eliminate to a certain extent the cutting back of the terminals because as trees begin to bear the terminals make a shorter growth. This past year we cut very little terminal growth.

Question: What is the average circumference of your trees?

Professor Vincent: I haven't any data on the limb growth and the circumference. However, about a foot from the ground I find that the winter-pruned trees are a trifle larger than the summer-pruned trees. Winter-pruned Jonathans averaged something like 22.2 inches and summer-pruned 22 inches.

Mr. Magness: What brought the fruit from the winter-pruned trees into the Fancy and C grades?

Professor Vincent: It was a matter of color entirely.

The First National Bank, Portland, Oregon, has just completed and is now occupying its new building, which is considered one of the handsomest bank buildings in the United States. The First National Bank of Portland is the only bank in the Northwest occupying the entire building. The bank reminds one in many ways of the Bank of England. A year ago the First National Bank of Portland took out an insurance policy covering the life of every employee.



One piece Pruner. Pruning Shears for top dressing, cutting berry bushes, rose bushes, etc.

Sectional Pruner. Three pruners in one. For all sized trees. Packed in cartoon. Price \$2.25, delivered at your postoffice.

The pump gun action, and with the greatest leverage on the Bastian Pruner, enables you to prune your trees with one-half the labor of all other pruners.

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STATION A, PORTLAND, OREGON



Fruit Growers' Conference, Spokane, 1916

[Editorial Note.—Since the Fruit Growers' Conference at Spokane strong opposition has developed to changing the present grading rules. The fruitgrowers are divided. It does not look wise to make a change unless the change will be satisfactory to a large majority of the growers. The fact of the matter is that no desire to change the grading rules occurred until 1916. When a change is made it should be made with due deliberation, not hastily, with a perfect understanding of market requirements. Another important fact in connection with changing the grading rules would be a definite knowledge of the profit the change will bring to the grower. It hardly seems there is sufficient information on these two subjects at the present time to jump into something, turning from grades that are not perfectly satisfactory at the present time to other grading rules that are not known well enough and satisfactory to a large majority. It seems to the editor of "Better Fruit" that inasmuch as Eastern fruitgrowers are putting up a better grade the Northwest should rather look to improve the grade instead of lowering it. The editor, for some time, has had the impression that when a change is made that only two grades should be packed, the C grade to be eliminated. However, with this proviso, some method should be adopted to control the amount of C grade, or the third grade, if it is packed at all, so that the quantity put up will be just about sufficient to supply the territory west of the Mississippi River. The editor of "Better Fruit" is convinced it will not pay to ship C grade east of the Mississippi River. In a nut-shell, the editor does not believe the fruitgrowers are sufficiently united to know just how to adopt new grading rules, or that they are sufficiently informed or have given the matter thorough enough investigation to know definitely just what changes in grading rules will be advisable, and therefore believes they should be held in abeyance for at least one year.]

that only duly elected delegates should be allowed to hold proxies.

Moved that only duly elected delegates be allowed to sit in the meeting or to hold proxies. Seconded. Motion lost.

A credentials committee consisting of A. A. Bousquet and N. D. Austin of Wenatchee and Ed Remy of Yakima was nominated and elected. An intermission was taken during the retirement of the credentials committee, the time being employed in a discussion of the horticultural laws of the State of

Washington by F. B. Utter, T. O. Morrison, W. P. Sawyer, L. Tichenal, C. H. Furman, W. Gwyn, Guy Seaton, J. F. Sugrue, W. O. Dow, Hanson, Patterson, Mrs. J. H. Stuckrath, Mr. Allen of Medford, Oregon, Commissioner Dean of Montana and R. M. Winslow, Provincial Horticulturist of British Columbia.

The Credentials Committee having completed their work, the chairman called for a report. N. D. Austin presented the report of the committee showing the seating of the following delegates with proxies as noted:

Pacific Coast Agents
**United States Steel
Products Co.**

San Francisco
Los Angeles
Portland
Seattle



J.C. Pearson Co., Inc.
Sole Manufacturers

Old South Bldg.
Boston, Mass.

PEARSON
ECONOMY in buying is getting the best value for the money. not always in getting the lowest prices. PEARSON prices are right.
ADHERSIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.
RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.
SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.
ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.
N A I L S

THE meeting was called to order by Assistant Commissioner of Agriculture T. O. Morrison, who read the official call for the meeting and then called for the election of a chairman. C. H. Hinman of Yakima nominated J. L. Dumas of Walla Walla. Seconded. Mr. T. O. Morrison and Dr. D. W. King of Wenatchee were also nominated.

Moved by L. Tichenal of Wenatchee that nominations be closed. Seconded. Carried.

J. L. Dumas was elected chairman, the election later being made unanimous.

J. R. Schwartze of Yakima nominated H. E. Waterbury of North Yakima for Secretary. Mr. Waterbury was elected.

Discussion followed as to seating of delegates, several speakers contending

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Don't fail to get our prices on Superior Orenco Trees on any list, small or large, you may need.

Consultation and advice perfectly free and willingly given.

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A Salesman's Position Now Open
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Report of Credentials Committee on
Seating of Delegates

YAKIMA VALLEY

Authorized delegates:

	Personal Vote	Proxies	Total Vote
George Biehn	1	..	1
Mrs. B. F. Moore	1	..	1
S. M. McKee	1	..	1
F. P. Horshell	1	..	1
J. W. Adamson	1	..	1
E. H. Powell	1	..	1
J. T. Baird	1	..	1
T. E. Stone	1	..	1
Robert Morgan	1	..	1
Jim Lancaster	1	..	1
H. C. Brown	1	..	1
A. G. Peterson	1	1	2
C. W. McCullagh	1	..	1
Ed Remy	1	1	2
J. W. Smith	1	..	1
Dr. P. W. Cornue	1	..	1
F. A. Williams	1	..	1
J. V. Vickers	1	..	1
H. C. Benson	1	..	1
Joe Hess	1	..	1
C. L. Hamilton	1	1	2
E. L. Porter	1	4	5
C. H. Swigart	1	1	2
C. H. Himmman	1	4	5
C. E. Sanderson	1	2	3
G. H. Tonnemacher	1	4	5
J. R. Schwartz	1	4	5
A. M. Burns	1	3	4
A. J. Reese	1	1	2
H. I. Macbeth	1	3	4
L. J. Shadbolt	1	3	4
L. J. Barbee	1	2	3
John Bamerman	1	1	2
E. J. Hatch	1	1	2
C. H. Furman	1	1	2
I. E. Waggoner	1	1	2
T. R. Slusher	1	1	2
J. C. Childs	1	1	2
C. E. Williams	1	1	2
J. W. Smith	1	1	2
B. F. Phelps	1	1	2
A. J. Reese	1	1	2
A. W. Losey	1	1	2
Elmer Dahlin	1	1	2

Total Yakima Valley, 78 votes.

WENATCHEE - NORTH CENTRAL
WASHINGTON

Authorized delegates:

	Personal Vote	Proxies	Total Vote
John Isenhardt	1	..	1
N. D. Austin	1	..	1
Ted Gibbons	1	..	1
J. B. Shons	1	..	1
August Moench	1	..	1
Dick Everett	1	..	1
John Gear	1	..	1
Ben F. Smith	1	..	1
T. J. East	1	1	2
C. A. Leedy	1	1	2
Wm. Hayden	1	1	2
H. J. Shotwell	1	..	1
Frederick S. Sydow	1	1	2
W. B. Hampson	1	..	1
W. H. Dixon	1	2	3
C. J. Peters	1	2	3
M. W. Starks	1	..	1
J. A. Warman	1	..	1
F. A. Wingate	1	..	1
H. W. Gates	1	..	1
E. T. Balch	1	2	3
Thomas Johnson	1	..	1
J. F. Sugrue	1	1	2
Alvin Rutledge	1	..	1
E. S. Russell	1	..	1
A. A. Bousquet	1	..	1
F. B. Utter	1	..	1
O. G. Tish	1	..	1
Dr. D. W. King	1	..	1
Eugene Page	1	..	1
Charles Cooper	1	..	1
S. O. Pool	1	..	1
C. A. Sterling	1	..	1
E. C. Huff	1	..	1
P. W. Lawrence	1	..	1
A. C. Tedford	1	..	1
Charles Goss	1	1	2
O. G. France	1	1	2
J. H. Ferryman	1	..	1
C. L. McKiltrick	1	1	2
B. Clement	1	1	2
H. A. Keisling	1	..	1
C. T. Haskell	1	..	1
F. W. Lary	1	..	1
W. H. Humphrey	1	1	2
P. M. Martin	1	1	2
J. G. Kennedy	1	..	1
E. C. Simonson	1	..	1
C. C. Moore	1	1	2
J. L. Weythman	1	2	3
Warren O. Dow	1	1	2
Ben Pickett	1	..	1
E. J. Brodrick	1	..	1

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Salem, Oregon

WENATCHEE-NORTH CENTRAL DISTRICT-Continued

	Personal Vote	Proxies	Total Vote
Ted Patterson	1	..	1
Robert Griffith	1	2	3
C. W. Babcock	1	..	1
J. N. Dodson	1	..	1
W. Gwyn	1	..	1
Tom Larson	1	1	2
C. R. Clark	1	1	2
M. V. Tukey	1	..	1
L. H. Tichenal	1	..	1
E. J. Nicholson	1	..	1
O. E. Storch	1	..	1
Total, Wenatchee-North Central Washington, 80 votes.			

SPOKANE DISTRICT

	Personal Vote	Proxies	Total Vote
L. J. Blot	1	4	5
Guy Seaton	1	..	1
L. McLean	1	1	2
John F. Davies	1	..	1
A. G. Craig	1	..	1
Total, Spokane District, 10 votes.			

WALLA WALLA DISTRICT

	Personal Vote	Proxies	Total Vote
J. W. Langdon	1	..	1
P. H. Weyrauch	1	..	1
C. W. Gilbreath	1	..	1
J. D. Taggard	1	..	1
J. L. Dumas	1	..	1
O. F. Erbes	1	..	1
Total, Walla Walla District, 6 votes.			

WHITE SALMON DISTRICT

	Personal Vote	Proxies	Total Vote
Dr. H. L. Geary	1	..	1
Paul McKercher	1	..	1
Total, White Salmon District, 2 votes.			

Signed

A. A. BOUSQUET,
N. D. AUSTIN,
E. REMY,

Credentials Committee.

Moved by E. L. Porter of Yakima that the report be adopted. Seconded. Carried.

Meeting adjourned until 1:15 p. m.

AFTERNOON SESSION

Meeting was called to order by the chairman.

Moved by J. R. Schwartz of Yakima that the meeting take up the Extra Fancy grade and develop it under the name of First Grade, Grade No. 1, or Extra Fancy. Seconded. Carried.

Moved by J. R. Schwartz of Yakima that "First Grade, Grade No. 1 or Extra Fancy apples are defined as sound, smooth, mature clean, hand-picked, well-formed apples only, free from all insect pests, diseases, blemishes, bruises and other physical injuries, scald, scab, scale, dry or bitter rot, worms, worm holes, spray burn, limb rub, visible watercore, skin puncture or skin broken at stem, but russetting within the basin of the stem will be permitted." Seconded. Discussion. Carried.

Moved by J. R. Schwartz of Yakima

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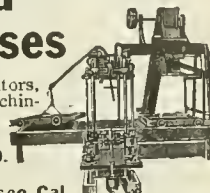


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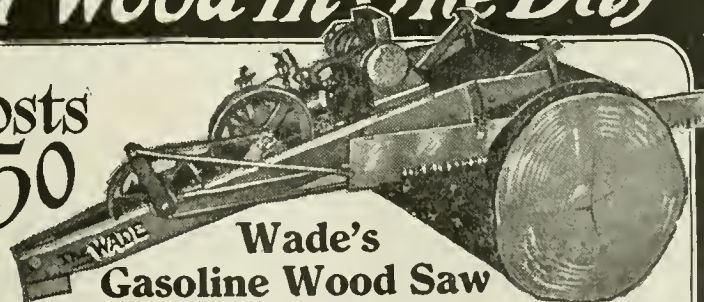
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that the following varieties be classed as "Solid Red Varieties":

Aiken Red, Arkansas Black, Baldwin, Black Ben Davis, Black Twig, Kaighn Spitzenberg, Gano, McIntosh Red, Wine-sap, Spitzenberg (Esopus), King David, Vanderpool. Seconded.

Dr. King of Wenatchee asked for information on the various varieties of Spitzenberg and the reason for leaving Jonathan out of the "Solid Red Varieties."

Mr. Gwyn of Wenatchee asked for information whether all "Solid Red Varieties" were presumed to carry the same percentage of color. Mr. Schwartze explained that it was his plan to consider color percentage later.

Mr. L. J. Blot of Spokane protested against lowering the standard of Jonathan.

J. F. Sugrue of Wenatchee spoke in favor of maintaining the standard of Jonathan.

Moved by C. R. Clark of Wenatchee as an amendment to the Schwartze motion that Kaighn Spitzenberg and Gano be taken out of the "Solid Red Varieties." Seconded.

The vote of the meeting being taken separately on these two varieties, Kaighn Spitzenberg was transferred to the "Striped or Partial Red Varieties" and Gano left in the "Solid Red Varieties."

It was moved and seconded that Jonathan be included in the "Solid Red Varieties."

Moved by N. D. Austin of Wenatchee that a roll-call vote be taken. Seconded. Carried.

On roll call 75 votes were recorded for the motion and 85 against. Motion lost.

Moved by E. S. Russell of Wenatchee that, in order to facilitate matters and save time, the chairman of each delegation cast the vote of his delegation, any dissenting votes to have the privilege of announcing themselves, excepting that if demanded a roll-call vote shall be taken. Seconded.

Moved by John F. Davies of Spokane, as an amendment that the chairman of each delegation "announce" rather than "cast" the vote. Seconded. Amendment carried. Original motion carried.

J. F. Sugrue of Wenatchee protested the vote of the Cashmere delegation, claiming that they were not following their instructions, and he presented to Assistant Commissioner Morrison a resolution said to be signed by the majority of the Cashmere growers.

W. Gwyn of Wenatchee contradicted Mr. Sugrue and protested against the introduction of the resolution in the records of the meeting. No action was taken.

J. R. Schwartze of Yakima presented the following list of "Striped or Partial Red Varieties" and moved its adoption:

Delicious, Stayman, Jonathan, Snow, Ben Davis, Hubbardston, Northern Spy, Jeniton, Rainier, Missouri Pippin, York Imperial, Wealthy, Wagener, Gravenstein, Jeffrey, Kaighn Spitzenberg, King of Tompkins County, Rome Beauty. Seconded.

Moved as amendment that Black Twig be placed in the list of "Striped or Par-

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tial Red Varieties." Seconded. Amendment was lost.

Moved by E. S. Russell of Wenatchee that a caucus of Delicious growers be held for the purpose of making recommendations on the requirements for Delicious. Seconded.

Chairman Dumas ruled the motion immaterial and out of order.

The Schwartze list of "Striped or Partial Red Varieties" was carried as read.

Moved by J. R. Schwartze of Yakima that the "Red Cheeked or Blushed Varieties" include the following:

Hydes King, Maiden Blush, Winter Banana, Red Cheeked Pippin.

Seconded. Carried.

Moved by J. R. Schwartze of Yakima that the "Yellow or Green Varieties" include the following:

Grimes Golden, Yellow Newtown, Cox's Orange Pippin, Ortley and White Winter Pearmain. Seconded.

Moved as an amendment by C. R. Clark of Wenatchee that Northwestern Greening, Rhode Island Greening and Yellow Bellefleur be included in the list of "Yellow or Green Varieties." Seconded. Amendment carried. Original motion carried.

Moved by F. B. Utter of Wenatchee that the percentage of color be computed on the basis of aggregate color rather than solid color. Seconded.

Moved as an amendment by J. A. Warman of Wenatchee that the percentage of color in "Solid Red Varieties" be computed on the basis of solid color and in the "Striped or Partial

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Red Varieties" as aggregate color. Seconded. Amendment lost. Original motion carried.

Moved by J. R. Schwartze of Yakima that the minimum color requirements for Extra Fancy apples be as follows:

Solid Red Varieties

Aiken Red	75%
Arkansas Black	75%
Black Ben Davis	75%
Gano	75%
Vanderpool	75%
Winesap	75%
Baldwin	50%
Black Twig	50%
King David	75%
Spitzenberg (Esopus)	75%
McIntosh Red	50%

Striped or Partial Red Varieties


Delicious	66 2/3%
Stayman	66 2/3%
Jonathan	66 2/3%
Raighn Spitzenberg	66 2/3%
Ben Davis	50%
Hubbardston	50%
Jeniton	50%
Northern Spy	50%
Rainier	50%
Snow	50%
Wealthy	50%
York Imperial	50%
Rome Beauty	50%
Wagener	50%
Missouri Pippin	50%
Gravenstein	25%
Jeffrey	25%
King of Tompkins Co.	25%

Seconded.

E. S. Russell of Wenatchee spoke in favor of lowering color requirements of Delicious and again asked for a caucus of Delicious growers. He was again ruled out of order by the chair.

L. J. Blot of Spokane objected to lowering the color requirements of the Baldwin and on behalf of the Spokane district, as the largest shipper of Baldwins, moved as an amendment that the minimum color required for Baldwin be 75%. The amendment was accepted by Mr. Schwartze as chairman of the Yakima delegation.

Moved as an amendment by E. S. Russell of Wenatchee that the minimum color requirement for Delicious be changed from 66 2/3% to 50%. Seconded. Amendment lost.



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Moved as an amendment by John Isenhardt of Wenatchee that the minimum color requirements for Stayman be changed from 66% to 50%. Seconded. Amendment lost.

Moved as an amendment by Chairman J. L. Dumas, who took the floor with the consent of the house, that the minimum color requirement for Kaighn Spitzenberg be changed from 66% to 50%. Seconded. Carried.

Original motion by Schwartz, as amended, was carried.

Moved by J. R. Schwartz of Yakima that the color requirement for the "Red Cheeked or Blushed Varieties" be "a perceptibly blushed cheek." Seconded. Carried.

Moved by J. R. Schwartz of Yakima that the color requirement for "Yellow or Green Varieties" be "characteristic color." Seconded. Carried.

Moved by J. R. Schwartz of Yakima that the meeting take up the second grade under the name of "Second Grade, Grade No. 2 or Standard Grade." Seconded.

Discussion of the change of name from "Fancy" to "Standard" with C. H. Hinman of Yakima and F. B. Utter of Wenatchee taking the floor in favor of the change and E. T. Balch of Wenatchee and L. J. Blot and John F. Davies of Spokane speaking in opposition. On a point of order raised by Mr. Davies the chair ruled the motion out of order as in conflict with the statute.

Moved by J. R. Schwartz of Yakima that the Fancy grade be defined as follows:

"Second Grade, Grade No. 2 or Fancy apples are defined as apples complying with the requirements for first grade apples except that slight sunscald or other blemishes not more than skin deep shall be permitted up to a total of 10% of the surface of the apple." Seconded.

A long discussion followed with E. L. Porter, S. M. McKee and C. H. Hinman of Yakima and W. O. Dow of Wenatchee speaking in favor of the motion and particularly in favor of the provision for 10% blemish, while W. Gwyn, J. A. Warman and J. F. Sugrue of Wenatchee were opposed to allowing more than 5% blemish.

Moved as an amendment by W. Gwyn of Wenatchee that the maximum blemish allowed be 5% instead of 10%. Seconded. Amendment lost. Original motion carried.

Moved by J. R. Schwartz of Yakima that the following color schedule be adopted for the second grade:

Solid Red Varieties

Aiken Red	25%
Arkansas Black	25%
Black Ben Davis	25%
Gano	25%
King David	25%
Spitzenberg (Esopus)	25%
Vanderpool	25%
Winesap	25%
Baldwin	15%
Black Twig	15%
McIntosh Red	15%

Striped or Partial Red Varieties

Delicious	15%
Jonathan	15%
Stayman	15%
Hubbardston	10%
Ben Davis	10%
Jeniton	10%

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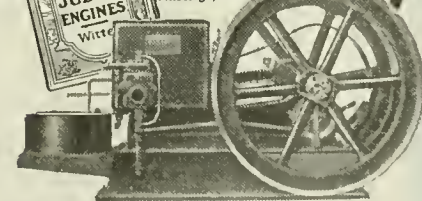
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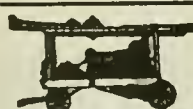
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Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will water-proof the crotch of a tree or a cavity or wound in a tree, when nothing else will do it.

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1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50 and 25-lb. wooden pails \$6.75. Write today for illustrated booklet on Leaf-eating Insects. Mailed free.

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Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot

Kaighn Spitzenberg	10%
Northern Spy	10%
Rainier	10%
King of Tompkins Co.	10%
Missouri Pippin	10%
Snow	10%
Wealthy	10%
York Imperial	10%
Rome Beauty	No color
Wagener	10%
Gravenstein	10%
Jeffrey	10%

Seconded.

Moved as an amendment by L. J. Blot of Spokane that the minimum color requirement for Baldwin be 25% instead of 15% as read. Amendment accepted by the Yakima delegation. Motion as amended was carried. Moved by J. R. Schwartz of Yakima that the "Red Cheeked or Blushed Varieties" require "a tinge of color" and the "Yellow or Green Varieties" require "characteristic color."

On suggestion of C. A. Leedy of Wenatchee, accepted by the Yakima delegation, requirements for Winter Banana were changed from "a tinge of color" to "characteristic color."

Color schedule, as amended, was carried.

Moved by J. R. Schwartz of Yakima that "Third Grade, Grade No. 3 or C Grade, shall consist of all remaining apples, free from infection, and if shipped in closed packages shall be marked "Third Grade." Seconded. Discussion as to whether worm stings should be included in this grade.

F. B. Ulter of Wenatchee offered as an amendment a resolution calling for an amendment to Section 15 of the Horticultural Law so that worm stings be allowed. Chair ruled that it is not an amendment and out of order.

J. R. Schwartz, with the consent of his second, modified his motion to read as follows: "Third Grade, Grade No. 3 or C Grade apples shall consist of all remaining apples, free from infection, excepting that if the next legislature so permits, two healed stings to the apple shall be allowed, and if shipped

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in closed packages shall be marked "Third Grade" or "C Grade."

Discussion followed on worms, worm stings and the meaning of the word "infection."

Moved as an amendment by A. A. Bousquet of Wenatchee that the words "two" and "healed" be stricken from the motion. Seconded.

Mr. Schwartze accepted part of the Bousquet amendment and presented his motion to read as follows: "Third Grade, Grade No. 3 or C Grade shall consist of all remaining apples free from infection excepting that two worm stings to the apple shall be allowed, providing that the next legislature shall amend Section 15 of the Horticultural Law to permit."

Moved as an amendment by W. Gwyn of Wenatchee that the clause relating to the legislature be stricken out. Seconded. Amendment carried.

Moved as an amendment by Guy Seaton of Spokane that pin-point scab not to exceed an aggregate of one-sixth of an inch in diameter be allowed in this grade. Seconded. Amendment lost.

Schwartz's motion as amended was carried.

Moved by L. H. Tichenal of Wenatchee that the following resolution be adopted: "Resolved, that our Senators and Representatives-elect be instructed to work and vote for an amendment to our state law permitting the shipment of worm-stung apples in accordance with the views expressed by the growers and delegates here assembled." Seconded. Carried.

Moved by W. Gwyn of Wenatchee, "Resolved, that the apples which are to be exported can be named anything we like." Seconded.

Mr. Morrison, upon interrogation, suggested that the federal authorities be consulted. No vote taken on the motion.

Moved by C. H. Hinman of Yakima that Third Grade or C Grade apples be shipped unwrapped. Seconded.

Moved as an amendment by W. O. Dow of Wenatchee that those desiring to wrap this grade shall have the priv-

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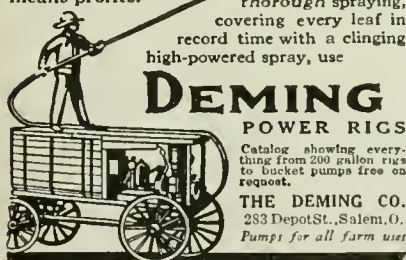
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ilege of doing so. Seconded. Amendment carried. Motion as amended carried.

Discussion took place on limiting sizes in various grades.

Moved by J. F. Sugrue of Wenatchee "that any size apple be admitted to the grades providing it be large enough to carry two stings and pin-point scab." No second.

Voted not to take action on sizes at this meeting.

Moved by C. R. Clark of Wenatchee that color as established for second grade be considered in connection with the defects. Seconded. Motion lost.

Moved by J. R. Schwartze of Yakima that the "Summer and Early Fall Varieties be packed as in 1916. Seconded. Carried.

Moved by C. H. Hinman of Yakima that the combination grades and orchard run be packed as in 1916. Seconded. Carried.

Moved by W. Gwyn of Wenatchee that all apples packed otherwise than according to the foregoing grading rules shall be accompanied by a printed description of the contents of each package. Seconded. Carried.

The following resolution was presented by John Isenhardt of Wenatchee and was unanimously adopted. "Resolved, that the delegates of this convention express to Mr. Dumas their hearty appreciation of his very fair and impartial rulings as chairman of this assembly."

As there was no further business to be presented to the meeting the chairman declared it adjourned.

Signed

J. L. DUMAS,

Chairman.

H. E. WATERBURY,

Secretary.

Apple - Grading Rules, Proposed by Third Grade and Pack Conference

First Grade, Grade No. 1 or Extra Fancy apples are defined as sound, smooth, mature, clean, hand-picked, well-formed apples only, free from all insect pests, diseases, blemishes, bruises and other physical injuries, scald, scab, scale, dry or bitter rot, worms, worm stings, worm holes, spray burn, limb rub, visible watercore, skin puncture or skin broken at stem, but slight russetting within the basin of the stem will be permitted.

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Second Grade, Grade No. 2 or Fancy apples are defined as apples complying with the requirements for first-grade apples except that slight sunscald or other blemishes not more than skin deep shall be permitted up to a total of 10% of the surface of the apple.

Third Grade, Grade No. 3 or C Grade apples shall include all remaining apples free from infection excepting that two stings to each apple shall be permitted, and if shipped in closed packages shall be marked "Third Grade or C Grade."

Combination Extra Fancy and Fancy Grade: When first and second-grade apples are packed together the package must be marked "Combination Extra Fancy and Fancy."

Combination grade may also include all other apple varieties not provided for in First and Second Grades.

When Second and Third Grade apples are packed together the package must be marked "Combination Second and Third Grade."

When First, Second and Third Grade apples are packed together the package must be marked "Orchard Run," but orchard-run packages must not contain any apples that would not meet the requirements of third grade.

Summer and Early Fall Varieties: Summer varieties such as Astrachan, Bailey's Sweet, Bietigheimer, Duchess, Early Harvest, Red June, Strawberry, Twenty Ounce Pippin, Yellow Transparent and kindred varieties not otherwise specified in these grading rules, together with early fall varieties such as Alexander, Blue Pearmain, Wolf River, Spokane Beauty, Fall Pippin, Waxen, Tolman Sweet, Sweet Bough and other varieties not provided for in these grading rules, as grown in sections of early maturity, shall be packed in accordance with the grading rules covering Fancy grade as to defects but regardless of color.



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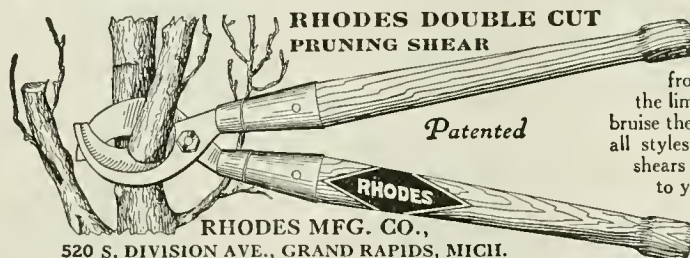
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The following varieties shall be admitted to the Extra Fancy and Fancy grades, subject to the color requirements herewith specified:

Striped or Partial Red Varieties

	Extra Fancy	Fancy
Delicious	66 $\frac{2}{3}$ %	15%
Jonathan	66 $\frac{2}{3}$ %	15%
Stayman	66 $\frac{2}{3}$ %	15%
Ben Davis	50%	10%
Hubbardston	50%	10%
Jeniton	50%	10%
Kaighn Spitzenberg	50%	10%
Missouri Pippin	50%	10%
Northern Spy	50%	10%
Rainier	50%	10%
Rome Beauty	50%	No color
Snow	50%	10%
Wagener	50%	10%
Wealthy	50%	10%
York Imperial	50%	10%
Gravenstein	25%	10%
Jeffrey	25%	10%
King of Tompkins Co.	25%	10%

Solid Red Varieties

	Extra Fancy	Fancy
Aiken Red	75%	25%
Arkansas Black	75%	25%
Baldwin	75%	25%
Black Ben Davis	75%	25%
Gano	75%	25%
King David	75%	25%
Spitzenberg (Esopus)	75%	25%
Vanderpool	75%	25%
Winesap	75%	25%
Black Twig	50%	15%
McIntosh Red	50%	15%

Red Cheeked or Blushed Varieties

Hydes King, perceptibly blushed cheek, tinge of color.

Maiden Blush, perceptibly blushed cheek, tinge of color.

Red Cheeked Pippin, perceptibly blushed cheek, tinge of color.

Winter Banana, perceptibly blushed cheek, characteristic color.

Yellow or Green Varieties

For Extra Fancy and Fancy, characteristic color.

Grimes Golden.

Yellow Newtown.

Cox's Orange Pippin.

Ortley.

White Winter Pearmain.

Yellow Bellefleur.

Northwestern Greening.

Rhode Island Greening.

All apples packed otherwise than according to the foregoing rules shall be accompanied by a printed description of the contents of each package.

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Just ask for a 30 day free trial. Then we ship
the Melotte. No salesman around to influence you. Use
the machine according to every test you can think of. If you de-
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If after 30 days you decide to keep the great
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monthly payments. Send the coupon now for free catalog and full
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WE offer you the Imported Belgian Melotte—the world's greatest
cream separator—at the rock-bottom, before-the-war price: the same price
charged in Belgium plus only \$1.75 for water freight.

Seize this opportunity to get a highest grade separator on this astounding offer. You want a quality

Try Them All!

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HERE'S a frank open suggestion:—
Have *every* manufacturer that is will-
ing to give you a free trial, ship his sep-
arator to you. If he is not willing to give you
a 30 day free trial, ask him *why* he won't—
get his reason.

Set them all up side by side, the Melotte and
all the others, and then make the test. Keep a
record of the results. See which skims the
closest—which gives you the most cream. Fig-
ure out, on this basis, which will bring you
the most profit. Notice which machine is
easiest to operate—which is the least tiring.
Then notice the construction. Which will stand
the most wear? Which is most substantial?

Then decide. Keep the one which has proved best.
We are willing to abide by your judgement without
a word. Remember the terms of our offer—if you
want to return the Melotte, you may do so at our
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VOLUME XI

MARCH, 1917

NUMBER 9

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Now it is widely said that this standard is extreme. Let us see.

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This is a foreign standard. John W. Bate, our efficiency engineer, spent a year in Europe in 1913. This double strength is one result of that visit.

The European idea is to build things to endure. And they apply that principle to their finest cars.

Years ago, when motor types were constantly advancing, endurance was not so important. Few bought their cars to keep. But now that cars are standardized, durability seems vital. Mr. Bate believes that Mitchells should be lifetime cars.

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Mitchell are built of toughened steel. Many parts are oversize. All parts which get a major strain are built of Chrome-Vanadium. The steel in Mitchells costs as high as 15 cents per pound. Gears are tested for 50,000 pounds per tooth.

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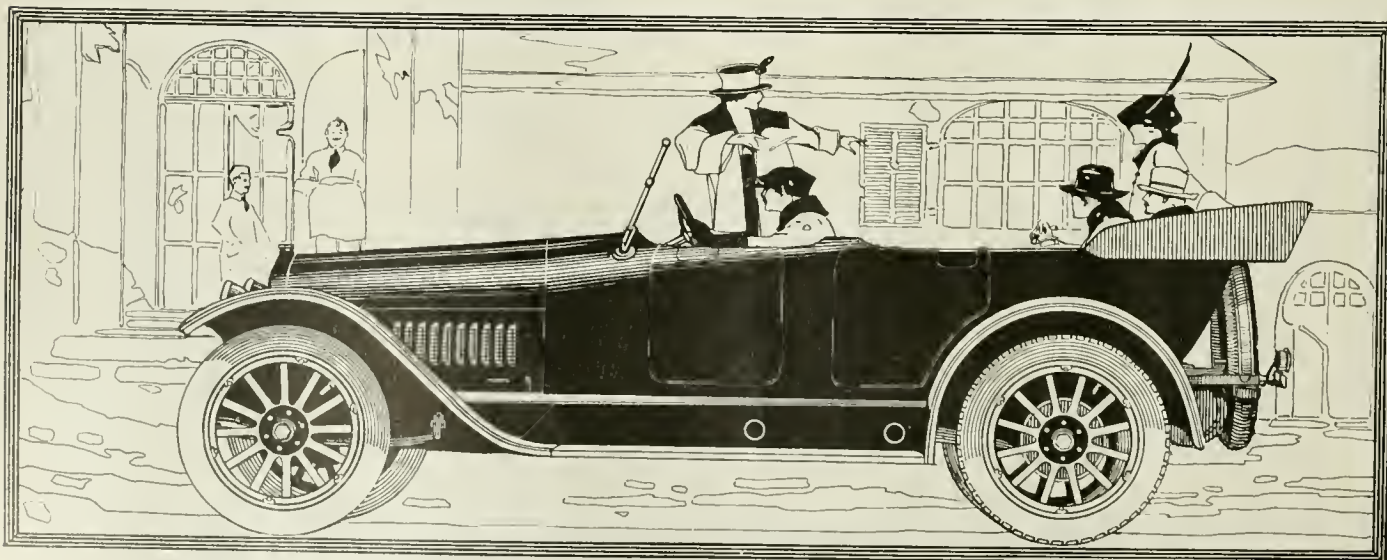
See all these extras, and judge what they mean to you. They cost us on this year's output at least \$4,000,000. They cost you nothing, because Bate factory methods save it in our shops.

An \$1150 Model, Too

This year's Mitchell comes in two sizes—Mitchell and Mitchell Junior. Both are roomy and powerful Sixes. But one is for seven passengers and one is for five. So you don't need to pay for more power and room than needed.

If you don't know the nearest Mitchell dealer, ask us for his name.

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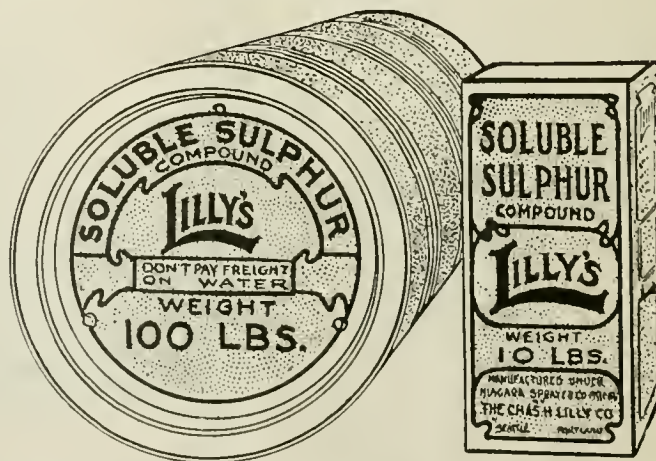
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Spray Formulas for 1917

By A. L. Melander, Entomologist, Washington Agricultural Experiment Station, Pullman, Washington

THERE is no single spraying that will kill everything. Select the ones that fit your case. Many plant diseases and pests cannot be controlled by spraying and require special treatments. For information about insects, pests, plant diseases and spraying write to the Experiment Station, Pullman, Washington. The advice is free.

1. LIME-SULPHUR

Ground sulphur 110 pounds
Fresh calcium stone lime.. 50 pounds
Water to make..... 50 gallons

Slake the lime with 10 gallons hot water. Stir in the sulphur and add the remainder of the water. Boil briskly until the sulphur is dissolved (about 45 minutes) stirring continuously and keeping the cooker covered. As the liquid boils down add water to keep to the original level. When finished let any remaining sediment settle. Use only the clear liquid, which may be stored if kept from the air. Prepared in this way lime-sulphur should have a hydrometer reading of about 26 degrees, Beaume, somewhat weaker than the factory-made product.

For use any concentrated lime-sulphur may be diluted according to the following table:

		To make 100 gals. spray use:	
Hydrometer test of concentrate		For dormant	For summer spray
Degrees Beaume	Specific Gravity	(1 lb. sulphur in 5 gal. sp. gr. 1.02)	(1 lb. sulphur in 10 gal. sp. gr. 1.01)
34	1.3015	6.7 gal.	3.3 gal.
32	1.2788	7.2 "	3.6 "
30	1.2569	7.8 "	3.9 "
28	1.2357	8.5 "	4.2 "
26	1.2153	9.4 "	4.7 "
24	1.1955	10.2 "	5.1 "
20	1.1578	12.3 "	6.2 "

Use as dormant spray when buds are swelling, for San Jose scale, oyster-shell scale, insect and mite eggs, bud-worm and twig borer. Concentrated lime-sulphur mixed with lime whitewash is useful to coat tree trunks for rabbits and borers. In summer strength for orchard mites. Also a valuable fungicide for mildews, apple anthracnose, apple scab, peach leaf-curl and lichens.

2. SODA-SULPHUR

The dry powdered forms of soda-sulphur on the market, such as Sprasulphur or Soluble Sulphur Compound, may be dissolved in water at the rate of about 50 pounds to 100 gallons, when they give a spray comparing in polysulphid (the killing value) content with dormant strength lime-sulphur. A similar spray may be prepared in liquid form as follows:

Ground sulphur 1½ pound
Potash or lye (Babbitt's)..... 1 pound
Hot water ¾ gallon

Add the ingredients to the hot water, whereupon the chemical reaction takes

place almost immediately. Stir a few minutes until dissolved. The concentrate may be diluted according to hydrometer test, but nearly twice as much should be used as in the case of lime-sulphur. For example, if the concentrate tests 24 degrees use 20 gallons (instead of 10.2) to make 100 gallons of dormant spray.

Use as dormant spray for same pests as lime-sulphur. Unsafe during growing season.

3. FISH-OIL SOAP

Water 20 gallons
Lye or potash, 98%..... 7 pounds
Fish oil 5 gallons

Boil the water, dissolve the lye in it and stir in the oil. Boil for two hours. This should make about 130 pounds of gelatinous soap.

Use (a) as an emulsifier for oil sprays, (b) to increase the effectiveness of nicotine spray, (c) dissolved 1 pound to about 5 gallons of water as a contact spray for soft-bodied insects like aphids, young scales, thrips, on tender plants. The addition of quassia is unnecessary. Laundry soap may be substituted for fish-oil soap.

4. CRUDE-OIL EMULSION

Boiling water 8 gallons
Lye or potash 3 pounds
Fish-oil soap (Formula 3)..... 20 pounds

Dissolve in order named to form the emulsifier; then, with vigorous agitation, slowly add 20 gallons of crude (not fuel) oil. The resulting miscible oil may be poured in the spray tank and with the agitator running fill with water to 200 gallons.

It is much more dependable to use the ready-made miscible oils on the market, which should be diluted according to the directions furnished on the container. Orchard Brand Oil, Sealecide National Soluble Oil and Dormant Soluble Oil have given us good results against San Jose scale.

Use as a dormant spray recommended where lime-sulphur has proved unsatisfactory. Not an efficient fungicide.

5. KEROSENE EMULSION

Kerosene 2 gallons
Fish-oil soap (Formula 3)..... ½ pound
Boiling water 1 gallon

Cut the soap in slices if hard, boil until dissolved and churn the hot suds into the kerosene, away from the fire. When emulsified stir into 35 gallons of water, for summer use. This spray has largely been replaced by nicotine.

Use: A contact spray for sucking insects, like woolly aphid, green aphids, plum aphids, etc.

6. NICOTINE, OR TOBACCO SPRAYS

40% nicotine (Blackleaf 40) . 1 pint
Fish-oil soap (Form. 3) . 3 or 4 pounds
Water 125 gallons

Dissolve the soap in hot water, add the nicotine and dilute.

A similar decoction can be made by soaking 50 pounds of dried tobacco plants in 100 gallons of water for 24 hours, stirring frequently. Strain and dilute the solution obtained with an equal amount of water and add the required soap. Such home-made spray is variable in nicotine content and will not keep.

Use: The standard summer spray for aphids or plant lice, leaf hoppers, orchard mites, thrips and young worms.

7. PYRETHRUM: HELLEBORE

Pyrethrum powder or white hellebore powder 1 pound
Warm water 2 gallons

Make a paste of either powder by stirring in a little boiling water, add the remaining water and let stand for 24 hours. Then dilute to about 15 gallons. The efficiency of this spray is increased by adding a solution of 1 pound of soap. Either powder may be dusted dry.

Use: For soft-bodied insects like currant worms, or slugs, especially on small fruits ready for picking.

8. ARSENATE OF LEAD

Arsenate of lead, paste..... 1 pound
Water..... 40 to 50 gallons

For newly-hatched insects it is not necessary to use it stronger. For old or large insects use double the quantity, or more. Smooth the paste thoroughly with a small amount of water before putting in the spray tank. Arsenate of lead powder is twice as strong as the paste. Do not use arsenate that feels gritty or that settles rapidly.

Arsenite of zinc powder or paris green are about four times as strong as paste lead. They are especially valuable for resistant insects like tent caterpillars, tussock worms and beetles, but may scorch in a damp season. If paris green is used as a liquid spray add 5 pounds of fresh slaked lime to each pound of poison.

Use: The standard poison for coating foliage or fruit as a protection against chewing insects, caterpillars, codling-worm, cherry slug, etc. Valueless for sap-sucking insects like aphids, scales, orchard mites, or leaf hoppers.

9. POISONED BAITS

Bran, shorts or flour 30 pounds
Paris green, zinc arsenite or white arsenic 1 pound

Mix dry, season with either (a) 4 lemons, ground through a meat chopper; or (b) 1 or 2 quarts molasses; or (c) 1 pound salt. Then add enough water to form a mash and scatter where required. Fresh horse manure, free of straw, may be used

instead of the bran, seasoning then with salt. Arsenite of soda (see Formula 15), the quickest-acting insect poison known, may be used as the poison in either formula at the rate of 3 pints of the stock solution to the 30 pounds of bran, etc.

Use: For cutworms, grasshoppers or crickets. Do not apply directly to young trees but distribute on the ground, either by spoonfuls or broadcast.

10. BORDEAUX

	Double	Standard	Weak
Bluestone (cop. sulphate) 10	5	2 lbs.	
Stone lime 8	5	2 lbs.	
Water to make.....	50	50	50 gals.

Dissolve the bluestone by suspending it in a sack in 25 gallons of water in a barrel, or by crushing it and adding to hot water. Slake the lime in another vessel, adding a little water slowly, and dilute to 25 gallons. Mix the two thoroughly, which is usually done by pouring the two simultaneously into a third vessel.

Use: (a) The standard formula is a repellent for leaf-eating insects because of the metallic taste. Valuable for cutworms, grasshoppers, flea beetles. (b) As a fungicide. Double strength used in Western Washington as a late fall or winter spray for anthracnose; the weak formula a summer spray on delicate foliage for cherry shot-hole or peach blight; the standard strength for scab.

11. SULPHUR

Sublimed flowers of sulphur or ground sulphur flour is sometimes used as a dust spray, either alone or diluted with equal parts of hydrated lime. As a liquid spray, for every 20 gallons stir 1 pound of sulphur into a flour paste made of 1 pound of flour and 1 gallon boiling water, before diluting.

Sulphur paste, milled sulphur, atomic sulphur and diatomic sulphur are commercial preparations containing about 50 per cent of finely-divided sulphur. They are used at 2 to 6 pounds to 50 gallons.

Use: For orchard mites and mildew. A stronger spray than iron sulphide, liable to burn very young fruit in hot weather.

12. IRON SULPHIDE MIXTURE

Lime-sulphur, 32°.....	5 gallons
Ferrous sulphate (green vitriol or copperas).....	20 pounds
Water to make.....	200 gallons

Add the lime-sulphur to the spray tank nearly full of water and with agitator running stir in the iron sulphate, previously dissolved in about 10 gallons of water. The mixture consists principally of black iron sulphide and finely-divided sulphur. It is the latter that gives value to the spray.

An equivalent spray can be produced by stirring together the following and then adding to a 200-gallon tank of water:

Water	25 gallons
Sulphuric acid, commercial.....	1.2½ quarts
Lime-sulphur, 32°.....	5 gallons

13. SOIL FUMIGANTS

A. Carbon Disulphide. Allow two-thirds ounce to each square yard of surface and cover immediately with

oilcloth. Extremely volatile and inflammable.

Use: For borers, cutworms, root weevils, wireworms; in strawberry fields, gardens, etc.

B. Cyanide. Pour 1 per cent solution of sodium cyanide (deadly poison) into spots requiring treatment. Do not inhale fumes. Destructive to plants as well as insects, but soil treated becomes safe in a few days.

Use: For exterminating ant nests, for woolly aphid and other subterranean insects.

	Lime-sulphur	Soda-sulphur	Soap	Crude oil emulsion	Kerosene emulsion	Tobacco	Arsenate of lead	Bordeaux	Atomic sulphur	Iron sulphid
Soda-sulphur	Ux									
Soap	O	Ux								
Crude oil emulsion.....	O	X	Xu							
Kerosene emulsion.....	O	X	Xu	X						
Tobacco	X	O	X	X	X					
Arsenate of lead	Xrs	O	Os	Xrs	Xrs	Xr				
Bordeaux	O	O	O	O	O	X	Xr			
Atomic sulphur.....	Ux	Ux	X	Ux	X	X	X	Ux		
Iron sulphid.....	Ux	Ux	X	Ux	X	X	X	Ux	Ux	
Lime	Ux	O	O	O	O	X	Xr	Ux	Ux	Ux

14. FUMIGATION FOR NURSERY STOCK

Sodium cyanide, 130%.....	1 ounce
Water	24 ounces
Sulphuric acid.....	1½ ounces

This amount is sufficient to fumigate 150 cubic feet. Place the nursery stock in a box made gas tight by sealing with building paper if necessary. Pour the acid into the water in an earthenware bowl and set it on the plants. Wrap the cyanide in a paper and drop into the bowl of acid, immediately putting down the cover. Fumigate for 30 to 45 minutes. Do not inhale any of the gas, for it is fatally poisonous. Do not fumigate evergreens. Do not fumigate stock after the buds open. For grafts or scions use two-thirds the formula. For greenhouses use one-third the formula.

15. WEED KILLERS

A. Iron Sulphate.

Iron sulphate (green vitriol or copperas).....	20 to 30 pounds
Water	50 gallons

B. Arsenite of Soda (poison).

White arsenic (arsenious acid) .	1 pound
Potash or lye	2 pounds

Boil the ingredients of B together in 2 gallons of water. For use dilute this stock solution to 50 gallons.

Use: Either A or B sprayed over young weeds will kill them. Used for mustards and other broad-leaved plants. Old weeds become very resistant.

16. COMBINATION SPRAYS

Some sprays are not injured if mixed together. Other sprays have their properties changed when combined and should not be mixed. A combination spray for apple scab, codling moth and aphids could consist of

40% nicotine	1 pint
Lime-sulphur, 32°.....	5 gallons
Arsenate of lead, paste	5 pounds
Water	125 gallons

To this spray soap should not be added. The following table shows what sprays can be mixed together and what

ones are incompatible. "X" indicates that there is but slight or no chemical reaction and the sprays can be safely mixed; "O" indicates that there is a reaction which harms or destroys the value of the individual sprays; "R" indicates that the mixture is more or less repellent to the taste of chewing insects and hence the combination is not apt to be so effective as if the arsenical were used alone; "S" indicates that the combination might scorch foliage; "U" indicates that the mixing is unnecessary:

PROGRAM FOR THE MORE USUAL ORCHARD SPRAYINGS

* W., Western Washington; C., Central Washington; E., Eastern Washington.

- When buds begin to swell:
Oil spray or 3 degree lime-sulphur (W, C, E*).
- A general cleanup for scales, insect eggs and fungi, particularly important for San Jose scale.
- With nicotine added, the most valuable treatment for aphids when buds first show green (W, C, E).
- When new foliage is first appearing:
Nicotine (W, C, E) usually unnecessary if given in preceding. For aphids, orchard mites, thrips, leafhoppers. With arsenical added (W). For budworm (W), twig borer (C).
- When blossoms are ready to open (apple, pear):
Lime-sulphur, 1.5 degrees. For scab (W, E) and mildew (W, C, E).
With nicotine added, for orchard mites, aphids, thrips.
- When last petals are falling (apple):
Arsenate of lead. For codling moth, caterpillars (C, E).
With lime-sulphur, 1.5 degrees, added. For scab (W, E) and mildew (W, C, E).
- Additional summer sprayings may be needed, as arsenate of lead for codling moth and caterpillars; nicotine for aphids, oyster-shell scale, mites; bordeaux for grasshoppers.
- In November:
Lime-sulphur, 3 degrees, or bordeaux, double or standard strength. For apple anthracnose (W).
Nicotine (W, C, E). For returning aphids.

HINTS ON SPRAYING

It takes a definite quantity of material to spray a tree thoroughly, whether applied at high or low pressure or whether applied as a mist or a driving spray. Low pressure does not save material, but wastes time. The labor

cost in spraying often exceeds the cost of the materials used.

High pressure is mainly valuable in lessening the time it takes to spray, but high pressure increases the range of a nozzle and adds to the penetrative force of the spray, thus bettering the chance of doing effective work.

The bodies of insects are greasy and hard to wet, yet many sprays depend on coming in actual contact with the insect in order to kill. Many insects and many eggs are located in the lowermost crevices of rough bark, out of reach of any but a penetration system of spraying.

Therefore, spray thoroughly. Direct attention to the hardest places to reach. Cover every surface. Wet behind the buds and into the bottom of every crack. Fill the lower calyx cup. Do not try to economize on spray by doing superficial work or by missing the ends of the branches. For all orchard spraying, use a high-pressure pump, 250 pounds if possible. Use only nozzles of the Clipper or Bordeaux type, as they alone combine speed, range and penetration. Use an 8-foot spray rod. Have a crook-joint to set the nozzles at an angle of forty-five degrees. Spray from a tower if the trees are beyond

reach from the ground. For dormant and calyx spraying throw most of the liquid downward, stroking the branches from the tips toward the trunk, but some spraying must be done in every other direction as well. Do not try to improve on the formulas by adding other ingredients or by using the spray stronger than recommended. There's a reason.

Watch your spray pump. Have it overhauled and in readiness before it is time to spray. Wash out the spray liquid at the end of each day's work. In freezing weather drain off the liquids when through.

Cost of Operation and Returns from Evaporated Fruits

By Dr. J. S. Caldwell, Plant Physiologist of Washington Agricultural Experiment Station, Pullman, Washington

[Editor's Note.—This article was prepared by Dr. J. S. Caldwell, Pullman, Washington, after extremely careful research work covering a period of many months. It is the Editor's opinion that the information is the most practical and valuable upon the subject that has ever been published and should be of great value to every fruit district, for the reason that every fruit district should be interested in evaporation. Conserving the waste has already impressed itself upon the fruit growers as a vital necessity, and therefore prompt consideration should be given. The information contained in this article was delivered in the form of an address before the Fruit Growers' Conference at the Ninth National Apple Show, Spokane, commanding the most serious consideration, resulting in a discussion by the growers which brought out many features and facts effectively and beneficially. This discussion will appear in the April edition of "Better Fruit," consisting of about two pages.]

TO attempt to deal with the varieties of fruit and berries which can be profitably grown for the cannery would be to start an endless discussion. I shall therefore confine myself to a discussion of the varieties of fruits which can be utilized through the medium of the evaporator and a statement of the returns which the grower may be expected to realize from such products. I trust that the members of the conference may realize clearly that in attempting to make a dollar-and-cents presentation of this subject I am undertaking a task which is made extremely difficult by a number of causes. The Northwest has not thus far produced any considerable volume of any evaporated fruit other than prunes. In consequence, the prices at which other dried fruits have been marketed have been determined by the relations of supply and demand in a restricted territory, in which Northwestern producers do not come into competition with producers in other regions, and have not been primarily determined by the prices ruling in the great export markets. When our territory begins to produce annually a volume of dried fruits greater than can be absorbed by adjacent non-fruit-producing states, we shall come into competition with Eastern makers of evaporated fruits, and shall have to market our product at prices determined by the visible supplies of the country at large, not by the quantities we may have to offer. While this is not likely to result in a general and permanent lowering of the prices received, it will necessarily result in yearly fluctuation of prices between wider limits. Also, our markets for

evaporated apples in particular are chiefly found abroad, and the whole course of our export trade has been interrupted by the war, that portion of our exported fruits which would have normally been taken by Germany having been absorbed by the Allies or by the Scandinavian countries. With the close of the war there will necessarily occur material changes in the avenues of distribution of our evaporated fruits; Germany will no longer occupy the place of a middleman in our dealings with Russia, and the Pacific Coast States will be in position to compete on even terms for considerable business formerly monopolized by other portions of the United States. In the face of such a reorganization, no amount of study of past conditions in the dried-fruit industry can enable anyone to make a forecast as to the trend of prices for the next five or ten years which can be anything better than a guess, but evaporated fruits have shared in the general upward trend of prices for the past two years and there is every indication that the general level of present prices will be maintained for some years to come.

The evaporation of this surplus fruit must by no means be considered as a panacea for all the ills of the grower; while it offers very real and substantial possibilities of aid, these possibilities have, and of necessity always will have, very definite limitations. These should be very clearly understood; some uninformed or reckless enthusiasts have done much harm by statements as to the possible returns to the grower from evaporating his low-grade fruit which are very wide of the facts. Such statements create dissatisfaction with the returns obtained from materials sold to operators of existing plants and may lead to disappointment and financial loss on the part of those who are led by such statements to engage in the business. Unfortunately some of our best Northwestern horticultural journals have given circulation to such misleading articles; one such journal published an article in September, 1914, which so completely summarizes the current misinformation in regard to the profits to be realized from the drying of fruits that I must quote it in some detail by way of contrast to

the actual facts. This article states, in speaking of 20,000 tons of cull apples produced in a certain locality, that they "would make 12,000,000 pounds of dry fruit worth approximately \$1,200,000." Continuing, the statement is made that "an evaporating plant would insure growers \$16.00-\$20.00 per ton for apples and would permit of the production of a first-class article at a price under 5 cents per dried pound, or at present would pay growers operating their own plants about \$35.00 a ton for second-grade apples." By way of contrast with this glowing statement, I may state the facts, which are that 20,000 tons of cull apples would yield 250 pounds per ton, or a total of 5,000,000 pounds of dry fruit, which was worth at wholesale in the city in which this article was written 7½ cents per pound, or \$362,500. While I have no means of knowing by personal experience, I am assured by people with better opportunities for knowing that there is a very considerable difference between \$1,200,000 and \$362,500. Moreover, any grower operating his own plant who realized \$35.00 per ton from his apples would have had to find a market willing to give 14 cents per pound, instead of the current price of 7½ cents, for the dry product. The operator of a dryer paying \$20.00 per ton for evaporator stock would have been facing a cost of 8 cents for the raw material from which to make a pound of dry stock, yet the writer of this article would have him produce a first-class dry stock at a total cost less than 5 cents per pound. I shall not lead you further into the realms of frenzied finance traversed by this authority, but shall try to return to and to remain upon the solid ground of established facts. The facts are: (1) The evaporator can never compete in the normal market for apples of fancy grade; it can utilize only stock of C grade or culls. (2) The evaporator cannot profitably handle peaches. (3) The evaporator does not offer a more profitable method of disposing of entire crops of berries than is offered by the open market, under anything approaching normal conditions. (4) The evaporator offers absolutely no possibilities for the profitable utilization of vegetables. While there still exists a mar-



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Greening, Mammoth Black Twig, Stayman Winesap.

Dark stock group: Yellow Newtown, Grimes Golden, Wagener, Roxbury Russet.

Of these three groups, the first makes the very white dried stock which is demanded by the market and which bears a price somewhat in advance of that realized from the darker product made from the varieties mentioned in the second and third groups. While these last yield a slightly larger quantity of dry product, the difference is not sufficient to wholly offset the difference in price, and operators of drying plants will undoubtedly offer slightly lower prices for the dark stock groups than for the varieties of the white stock group.

The prices which the operator of an evaporator can pay for apples will primarily depend, if we disregard such details as size of plant and character of its equipment, upon the variety of fruits available for use. If the region be one which produces apples only, the working season in the plant cannot exceed eighty or ninety days at most each year, and the overhead charges—interest, depreciation and repairs, superintendence, and insurance,—will make up 20 to 22 per cent of the total cost of operation. If the district be one which supplies loganberries, raspberries, blackberries, peaches and apples, in sufficient quantities to keep the plant in continuous operation over a period of one hundred and fifty to one hundred and eighty days, the overhead charges may be reduced to 12 or 14 per cent of the cost of operation, and a corresponding increase in the prices paid for raw materials may be made. In operating upon apples, prices paid for the fruit will also depend upon whether the plant makes use of peels and cores as vinegar stock or discards them entirely. In the latter case, prices must range considerably lower than if the plant has a press and generators for the working up of vinegar stock. From one ton of culls, free from decay and of average orchard-run size, the dryer will obtain 250 to 265 pounds of dry stock, averaging "prime" quality. From the 600 pounds of peels and cores obtained from one ton of apples there will be made 45 gallons of vinegar stock, while the 200 to 250 pounds of pomace remaining will have a feeding value very nearly equal that of a good quality of corn silage and will well repay the labor required to place it in the silo. At prevailing prices, the operator will have 250 pounds dry fruit, at 6½ cents, \$16.25; 45 gallons vinegar stock, at 5 cents, \$2.25, a total of \$18.50.

Against this amount there must be charged the cost of manufacture, packing and marketing. If the district were one engaged in general fruit growing to such an extent that the plant could be kept in operation from mid-July to mid-December, the manufacturing and marketing costs for apples might easily be kept to 2.2 cents per dry pound, or \$5.50 per ton of fruit used. If the plant operated only upon apples and consequently for a 60 or 90-day season, man-

Continued on page 31



STARK TREES BEAR FRUIT

STARK TRADE MARK

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for 1917, Secrets of Fruit Profits, **FREE**—just off the press. Crammed with money-making facts—life photos of fruits in natural colors—tells how orchardists have grown rich. Learn how they got \$12 per barrel for apples and \$2.70 per crate for peaches. **Stark Trees** **FREE**
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ket for small quantities of dried vegetables, as cabbage, turnips, onions, celery, spinach, and tomatoes, this market is becoming more contracted every year, and dealers in such products annually find greater difficulty in disposing of the output.

The evaporating plant must therefore be regarded strictly as a means of utilizing (1) unmarketable grades of the better commercial varieties of apples; (2) varieties of apples, regardless of grade, which cannot profitably be marketed fresh or which it may become necessary to withdraw from the markets and from competition with standard varieties; (3) prunes, cherries and apricots; (4) berries of certain varieties; (5) peaches of lower grades. The evaporator cannot and must not be regarded as a catch-all for any and all varieties of any fruit. The cannery can make use of a very much wider variety of fruits than it is possible to handle in the drying plant, which cannot make any use of some of the varieties which are most desirable for canning, simply because no demand for these fruits, as dried products, exists, either in the domestic or the foreign markets.

APPLES

It is not profitable to attempt to make use of summer varieties of apples in the evaporator, nor can windfalls and immature fruit of autumn and winter varieties be utilized except at very low prices. The yield of dry product from summer varieties and from immature fruits is low, drying must be considerably more complete than with mature fruit, and the stock is inferior in quality, readily susceptible to spoiling outside cold storage, and bears very low prices in the markets. All varieties of late autumn and winter apples, when mature, may be used, but as the business is extended and systematized these varieties will undoubtedly be classified into three groups, in the order of their desirability for drying purposes. These groups will be determined primarily by the color of the dry stock which can be made therefrom, and the principal varieties of each group will be the following:

White stock group: Esopus Spitzenberg, Ben Davis, Baldwin, Northern Spy, Hubbardston Russet.

Golden stock group: Winesap, Jonathan, Rome Beauty, Rhode Island

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Suggestions for Control of More Serious Plant Diseases

By Leroy Childs, Entomologist and Plant Pathologist, Hood River Branch Experiment Station

[EDITOR'S NOTE.—"Better Fruit" has published in previous years the methods of control for plant diseases, as recommended by the state experiment stations in the Northwest, and spray calendars. While it is generally true that the methods of control and the remedies used are nearly the same in the different sections, it is important that the fruit growers should bear in mind that in different sections and under different climatic conditions the dates of the different sprayings, the number of the different sprayings and the strengths vary to a greater or less extent. Therefore fruit growers should not adopt this program for their particular sections without interviewing their own experiment stations or their consulting horticulturists. Particular attention is called to the fact that while three sprayings for codling moth are generally ample in Hood River districts, in some districts four or five are frequently considered necessary. Growers are cautioned to use care and judgment in the application of lime and sulphur, both as to strength and the weather conditions at the time of application, as more or less burning is apt to occur from the application of lime and sulphur if applied late in the year when the weather is becoming extremely warm.]

Apple Scab.—At the present time no more satisfactory recommendation can be given for the control of apple scab than that outlined for the past season, which includes five applications of lime-sulphur, dilutions of which are reduced as the season progresses.

Several new features were included in experimental work directed toward the control of scab during the past year. These include the experiments pertaining to the following: First, the dusting of trees instead of spraying for the control of both scab and codling moth; second, the consideration of greater dilutions of lime-sulphur than at present used in the many sprays for controlling scab; and, third, substitutes for lime-sulphur in the latter spray, in order to avoid injury from burning. Considerable time has also been given to the study of the life history of this disease, and its relation to our present control measures. Much valuable data have been obtained in these various fields of endeavor. The work is not sufficiently completed or tested, however, to warrant drawing conclusions at this time.

The following program will not only be found effective in controlling this disease, but it is so arranged that by combining other ingredients with the lime-sulphur powdery mildew, codling moth, brown and green aphids can be readily controlled at the same time. Of the list of sprays that are included in this program it will not be necessary in all cases to use the materials present, as some of the orchards are free from some of the pests mentioned. Before it is time to put on the application recommended, the orchardist should determine whether his orchard contains the pest or not.

Powdery Mildew.—From the experimental work which has been in progress now for a year, and which is still not completed, it is safe to say that up to the present time control measures in Hood River have not been attempted early enough to bring about entirely effective results. The disease becomes active shortly after the semi-dormant period, blighting from that time on, fruits spurs, terminal growths and

foliage. In the work which has been conducted, several combinations have been used during the past season, the most effective of which has been found to be iron sulphide mixture used at the rate of 10 gallons of the mixture to 100 gallons of water. Atomic sulphur, used at the rate of 12 pounds to 100 gallons,

was observed to be fairly effective, but did not reduce the disease to the extent that did the iron sulphide mixture.

Last year the disease was kept under control with four applications, iron sulphide being used in the first four scab sprays. These are the recommendations given in the spray program. The

TABLE V.—SPRAY PROGRAM FOR THE CONTROL OF INSECT PESTS AND PLANT DISEASES OF THE APPLE.

(This is adapted chiefly for Hood River conditions.)

Application	Insect and Plant Disease	Materials and Time of Application
1. Miscible oil	Leaf roller San Jose scale Brown aphid	<i>For Leaf Roller:</i> Miscible oil 6-100. Use only in orchards where leaf roller control is desired or where San Jose scale is serious. This application should be made under warm, settled weather conditions only. (See article Hood River Experiment Station Bulletin.)
2. Delayed dormant	Apple scab Mildew Brown aphid	<i>For Scab:</i> Lime-sulphur, 32°, 1-20.* <i>For Mildew:</i> Add iron sulphide mixture 10-100. <i>For Brown Aphid:</i> Add tobacco (nicotine sulphate) 1-1200. This spray should be applied at time first leaves are unfolding about the bud clusters on the fruit spurs.
3. Pink application	Apple scab Mildew	<i>For Scab:</i> Lime-sulphur 32°, 1-25. <i>For Mildew:</i> Add iron sulphide mixture 10-100. This application should not be made until the fruit has separated in the clusters, otherwise the entire surface of the young developing apple cannot be completely covered.
4. Calyx application	Apple scab Mildew Codling moth	<i>For Scab:</i> Lime-sulphur 32°, 1-35. <i>For Mildew:</i> Add iron sulphide mixture 10-100. <i>For Codling Moth:</i> Add lead arsenate 4-100, paste. Use 2½-100 of powder. Apply after petals fall.
5. Ten day application	Apple scab Mildew	<i>For Scab:</i> Lime-sulphur 32°, 1-40. <i>For Mildew:</i> Add iron sulphide mixture 10-100. This should follow the calyx application within ten days or two weeks.
6. Thirty day application	Apple scab Codling moth (and possibly) Green and Woolly aphid	<i>For Scab:</i> Lime-sulphur 32°, 1-40. <i>For Codling Moth:</i> Add arsenate of lead 4-100. <i>For Green and Woolly Aphid:</i> Add tobacco (nicotine sulphate) 1-1200. Apply thirty days after calyx application. Great judgment should be used in making this application in order to avoid possible spray injury. Avoid drenching. Do not apply lime-sulphur during hot weather, or if hot weather is anticipated within ten days or two weeks. Before spraying the advice of the nearest pathologist should be obtained. This is not a good combination for all four pests considered. Lime-sulphur should be used very lightly in order to avoid injury, while the insecticides should be used in larger amounts. If aphids are bad these should be applied separately.
7. July spray	Green and Woolly aphid	<i>For Green and Woolly Aphid:</i> Tobacco (nicotine sulphate) 1-1200; soap 3 lbs.-100 gallons. This spray should be used only in case orchard is found infested with either or both these insects.
8. Third codling moth	Codling moth Anthracnose Late scab	<i>For Codling Moth:</i> Arsenate of lead 4-100. <i>For Anthracnose:</i> Add bordeaux 3-4-50. Date of this application is dependent upon the seasonal development of the codling moth and will be recommended from the local experiment station.
9. Fall application	Anthracnose	<i>For Anthracnose:</i> Bordeaux mixture 6-6-50. To be applied as soon as the apples are harvested.

* See dilution table for lime-sulphur at different degrees Beaume.

† See method of preparation of this mixture in accompanying article.

TABLE VI.—DILUTION FOR LIME-SULPHUR AT DIFFERENT DEGREES BEAUME.
Prepared by Mr. R. H. Robinson, Assistant Chemist, Oregon Experiment Station.

Degrees Beaume	Delayed dormant spray	Pink spray	Calyx spray	10 day spray	30 day spray
36.....	1 to 22.7	1 to 28.3	1 to 40.0	1 to 45.6	1 to 57.4
35.....	1 to 22.0	1 to 27.5	1 to 38.8	1 to 44.2	1 to 55.6
34.....	1 to 21.3	1 to 26.7	1 to 37.5	1 to 42.8	1 to 53.7
33.....	1 to 20.7	1 to 25.8	1 to 36.2	1 to 41.3	1 to 51.9
32.....	1 to 20.0	1 to 25.0	1 to 35.0	1 to 40.0	1 to 50.0
31.....	1 to 19.4	1 to 24.2	1 to 33.7	1 to 38.6	1 to 48.2
30.....	1 to 18.7	1 to 23.3	1 to 32.3	1 to 37.1	1 to 46.4
29.....	1 to 18.0	1 to 22.5	1 to 31.0	1 to 35.6	1 to 44.5
28.....	1 to 17.3	1 to 21.6	1 to 29.7	1 to 34.2	1 to 42.7
27.....	1 to 16.6	1 to 20.8	1 to 28.3	1 to 32.8	1 to 40.9
26.....	1 to 16.0	1 to 20.0	1 to 27.0	1 to 31.3	1 to 39.0
25.....	1 to 15.4	1 to 19.1	1 to 25.7	1 to 30.0	1 to 37.2
24.....	1 to 14.7	1 to 18.3	1 to 24.3	1 to 28.7	1 to 35.4
23.....	1 to 14.0	1 to 17.4	1 to 23.0	1 to 27.2	1 to 33.5
22.....	1 to 13.3	1 to 16.5	1 to 21.6	1 to 25.8	1 to 31.7
21.....	1 to 12.6	1 to 15.8	1 to 20.3	1 to 24.5	1 to 30.0
20.....	1 to 12.0	1 to 15.0	1 to 19.0	1 to 23.0	1 to 28.2

This table was prepared considering lime-sulphur at 32° Beaume as a standard. Concentrates testing higher or lower are arranged so that they will contain the same amount of sulphur in the diluted spray.

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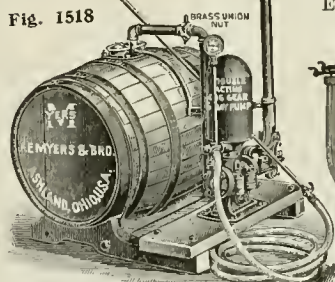
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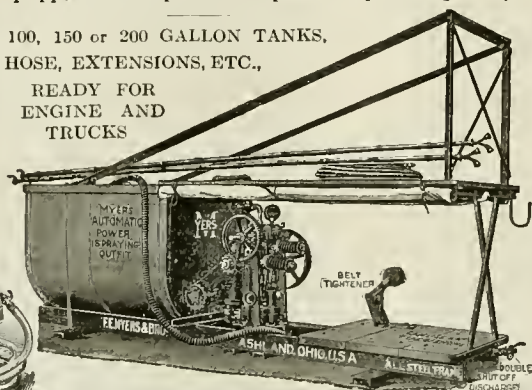


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iron sulphide mixture is made as follows: Take 10 pounds of iron sulphate (copperas), suspend it in a sack well toward the top of a 50-gallon barrel which contains about 40 gallons of water and allow it to dissolve. As soon as the copperas becomes dissolved, add about 3 gallons of lime-sulphur solution. A black precipitate immediately forms. The solution should be allowed to settle for two to six hours. In order to determine whether all of the sulphide has been precipitated, place a little of the clear liquid from the top of the barrel in a tumbler and add a few drops of lime-sulphur concentrate. If a black residue forms by adding the lime-sulphur, then add about one-half gallon more lime-sulphur concentrate to the barrel and stir again. After it settles, test again, and add more lime-sulphur to the barrel if a precipitate is formed when lime-sulphur is added to the clear liquid. If no further precipitation occurs upon addition of the lime-sulphur, drain this top liquid off by siphoning down to the black muck.

The clear liquid is of no use and should be thrown away. Fill the barrel containing the black muck and

allow it to settle. Again drain off the clear liquid, fill the barrel full of water and stir. This is now ready for use. Ten gallons of this black liquid will make 100 gallons of diluted spray. In view of the fact that the sulphide settles very rapidly, always stir up the materials in the barrel before dipping out the material to make the diluted spray.

Anthracnose.—The handling of the large crop of apples during this past year, combined with the early rain, prevented the greater majority of orchardists from applying the anthracnose spray during the fall of 1916. This disease will therefore probably be prevalent in the Hood River Valley during the coming year. No orchard in which bordeaux mixture was omitted in 1916 should go unsprayed this fall, for the results may become very serious.

Quite often, as was the case this year, it is practically impossible to get the spray on the trees after the harvest, owing to the occurrence of early rains. For this reason bordeaux 3-4-50 should be added to the last codling-moth spray, the date of application depend-

ing upon the development of the insects. This should usually be made between August 10 and 25. Experimental work carried on during the past two years has demonstrated that this material can be used at this time with safety to the apples. If applied thoroughly, it is of great value in preventing early anthracnose infection, which may result from rains occurring before the fruit is picked. Under ordinary conditions this spray will keep the disease well in hand in orchards comparatively free from the trouble. Seriously infected orchards, however, should not only receive this summer application, but the regular fall bordeaux mixture 6-6-50, which should be applied as soon as the fruit is picked.

Pear Fire Blight.—The outbreak of fire blight which occurred in several sections of the valley last year should serve as a very distinct warning to all orchardists that they be on the alert for a return of this disease in the future.

The value of maintaining a careful watch for this most serious trouble cannot be over-emphasized. Unless orchardists take more interest in the future than they have shown in the past, the disease will cause more trouble than all of the rest of the insect pests and plant diseases that demand attention at the present time. This disease is caused by a bacterium which attacks all parts of the tree—blossoms (known as blossom blight), twig blight (that of killing and blackening of vigorously growing terminals), and body blight. The disease in the latter form attacks the limbs and trunks, forming large cankers, and ultimately girdling and killing the tree.

All suspected cases of blight should be reported to the county fruit inspector before control is attempted.

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This will assist the proper authority to determine areas of infection and enable him to eradicate the trouble with greater ease. Fire blight can only be controlled by cutting out the injured parts. Tools should be disinfected before and after making each cut in order to avoid the further spreading of the disease by these instruments. Corrosive sublimate, which can be obtained at any drug store, should be used at a dilution of 1 part to 1000 parts of water.

Pear Bark Blister.—During the past year many pear trees were observed possessing more or less well-defined cankers upon the larger limbs and body. The cause of this destruction of tissue has not been determined, but winter freezing is suspected to be the chief cause for the formation of these injured areas. No disease has been isolated from these places. Anthracnose has been found in several cases, but infection from this disease is not as a rule prevalent upon the pear. Spraying for the control of this disease upon pears is the same as for apple.

The writer has examined many cankers during the past fall, and has found that a great majority of them are rapidly healing over. Those so doing should be left alone until recovery is complete. In the case of large body wounds, where a large amount of heart wood is exposed, the application of a good coating of white lead paint is suggested in order to reduce the possible entrance of heart-rot organisms to a minimum until the bark is completely healed over. This application should be repeated two or three times a year. The use of white lead and raw linseed oil is recommended.

Pear Scab.—Though a different organism pear scab closely resembles apple scab in appearance and method of attacking the fruit. Its control is much the same as that of apple scab. In orchards which have suffered losses from this disease, the program given for the control of apple scab will be found effective.

California Peach Blight.—During the past two or three years California peach blight has become very prevalent at Hood River and the surrounding country. This disease, together with peach-leaf curl, is killing many peach trees. The fungus attacks twigs, buds, foliage and fruit. In the case of the old branches and twigs, irregular cankers are formed, from which a thick

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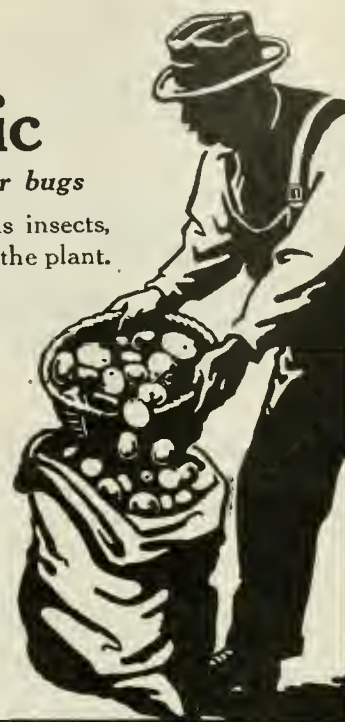
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gum exudes. Infections on the newer growth are at first red, or reddish brown in color, changing with the destruction of the tissues to a dark brown color, eventually forming a small black canker. These cankers often completely girdle small twigs, resulting in their death. Infection also very often occurs on the fruit, and if sufficiently extensive, destroys the marketability of the product. Reddish brown spots occur upon the skin of the fruit from which exude long, semi-transparent threads of gum. The fruit of the apricot is often attacked and becomes

badly deformed, owing to the infection caused by this disease. On trees badly infected large numbers of the fruit and foliage buds are destroyed during the fall and winter.

Peach blight can be controlled by pruning and proper spraying. In the case of the older trees, a large portion of which is diseased and partly dead, heavy cutting should be resorted to in order to develop new wood and bearing surfaces. In connection with this work, the trees should be sprayed at least three times a season in order completely to protect the new wood from



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BIRMINGHAM

infection. The fungus is active during a greater part of the year. On this account it is necessary to spray in the fall in order to protect the trees from infection, which occurs during the rainy weather. Either bordeaux 6-6-50 or lime-sulphur 1-15 will be found effective in combating the disease at this time. The first application in the spring should be made just before the buds burst. This application will control leaf curl as well. Lime-sulphur 1-10 is suggested. It has advantages over bordeaux, since, if there are any scales present, these will also be destroyed. The second spring application should be applied to the affected trees when the fruit is about the size of a pea. Atomic sulphur, used at the rate of 8 pounds to 100 gallons, is suggested

for this application, or self-boiled lime-sulphur used at the rate of 8 pounds of lime, 8 pounds of sulphur to 50 gallons of water. Lime-sulphur concentrate should not be used at this time, as it will cause a decided defoliation.

Peach-Leaf Curl.—Peach-leaf curl, when it is left unattended, does a great deal of damage in the Hood River Valley. A parasitic fungus causes this disease. The leaves become over-sized, thickened, twisted, and eventually drop prematurely without performing their proper function. Quite often the trees are defoliated two or three seasons in succession, with the result that the trees become greatly devitalized. This disease is easily controlled by spraying with lime-sulphur 1-10 before the buds burst in the spring. Infections occur

as soon as the leaves begin to show, and sprays applied after that date are useless.

Winter Rhubarb

In the winter time when fresh vegetables are not in the market in the Northwest, except those that are brought in from California, on which prices are usually very high on account of freight rates, it is a good idea for the fruitgrower and farmer to have some winter rhubarb, a variety of rhubarb which thrives well under ordinary winter conditions, providing a supply of this excellent vegetable. In addition to its value as a fresh vegetable to the fruitgrower it can be grown and sold on the market at very satisfactory prices, ranging from 75 cents to \$1.50 per box of thirty pounds, which pays pretty good prices to the producer.

Mr. White of the Northwestern Fruit Exchange, early in January, announced that 80 per cent of all cars of apples shipped by the Northwestern Fruit Exchange to January first had been paid for in full to the shipper. Checks were mailed to the shippers on an average of 29 days after the shipment had been made. Quick action like this in getting returns certainly is a big factor in satisfying the grower.

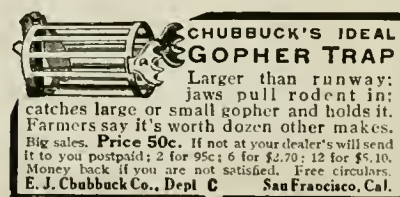
The Brewster District Unit was first in the field with the closing of Jonathan and King David pools, and are now out with final figures on the Delicious pool. The prices, net to the Unit, are as follows:

Extra Fancy—	Boxes	Price
36s-38s	3,494	\$1,558
96s-125s	1,201	1,458
138s and smaller	222	1,358
Fancy—		
36s-38s	1,348	\$1,258
96s-125s	554	1,158
138s and smaller	147	1,058

Ray Tedford, one of the trustees of the Brewster Unit, commenting on these figures, says: "These figures are highly gratifying to our growers. Most of our extra fancy was packed under the "Skookum" brand and the figures shown are absolutely net to the Unit after deducting all advertising and selling expenses."

Apples shipped and in storage January 1st, 1917, in the State of Washington, are approximately as follows:

	Shipped	Unshipped
Yakima	5,833	1,568
Wenatchee	6,249	1,082
Spokane	700	60
White Salmon-Husum	91	5
Walla Walla	419	
Total No. cars shipped ..	13,292	
Total No. cars unshipped		2,715
1916 commercial apple crop, cars		16,007



The Length of Ascospore Activity

By Leroy Childs, Entomologist and Plant Pathologist, Hood River Branch Experiment Station

FROM investigations carried on during the past three years relative to the control of apple scab in the Hood River Valley, Oregon, it has been found that the so-called "pink application" or cluster-bud application as used throughout the Eastern States as the first scab spray is not sufficiently early to obtain complete control of the disease. Jackson and Winston (1) in their investigations of 1914 at Hood River failed to

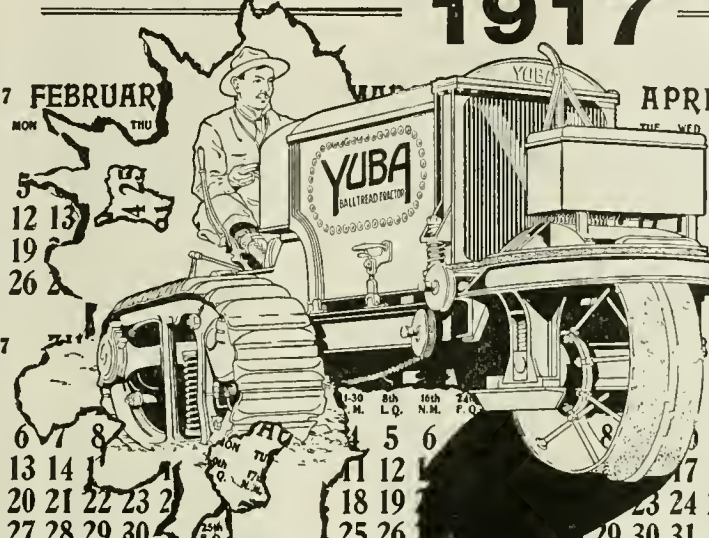
control scab owing to the fact that serious infection occurred before they made their first or cluster-bud application.

In 1915 Mr. J. R. Winston and the writer continued the investigations relative to the control of this disease. Mature ascospores were observed in the field about the middle of March. In order to determine whether a spray earlier than the "pink application" was

necessary all of the experimental plots were divided in two parts; one-half received the so-called "delayed-dormant" application and in the other half the first spray was applied in the "pink" or cluster-bud stage. Subsequent applications were identical in both sections. In every experiment much better control of the disease was obtained on the trees which received the early spray. In some of these a difference in the control of scab of fully fifty per cent occurred.

In view of the fact that little is known concerning the life history and

1917



1917 FEBRUAR

SUN	MON	TUE	WED	THU
4	5			
11	12	13		
18	19			
25	26			

1917

SUN	MON	TUE	WED	THU	FRI	SAT
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APRIL 1917

TUE	WED	THU	FRI	SAT
		5	6	7
		12	13	14
		19	20	21
		26	27	28
		29th N.M.	30th F.Q.	

MAY 1917

SUN	MON	TUE	WED	THU	FRI	SAT
1st P.M.	2nd L.Q.	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31st N.M.	1st F.Q.	

JUNE 1917

THU	FRI	SAT
4	5	6
11	12	13
18	19	20
23	24	25
29	30	31st N.M.

1917 NOVEMBER 1917

SUN	MON	TUE	WED	THU	FRI	SAT
1st L.Q.	2nd N.M.	3rd F.Q.	4th P.M.	5th	6th	7th
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

All the year around tractor

THE SPRING RUSH is the busy season for Yuba tractors—no time for adjustments, not a moment to be used in making repairs. The busy plowing season is a test of the stamina and sturdiness of the Yuba.

But no matter how successfully a tractor comes through this endurance test, it is not necessarily a good investment. The spring plowing season does not last long.

If the tractor is to make good as a year in and year out investment, it must do more than the plowing. It must have the power to pull a harvester, the steadiness to drive a thresher or a pump, the speed for light discing or harrowing and the flexibility for road hauling.

The Yuba meets these conditions. It is an all-year-around tractor. It combines sturdiness and versatility. It replaces all your horses.



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Yuba Manufacturing Company Dept. E-1
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Gentlemen: Kindly send me catalog and prices on the Yuba Ball Tread Tractor.

I am interested in Model 12-20 _____ Model 20-35 _____

Name _____

Town _____ State _____

P. O. Box _____ Size of farm _____

[Check main crop raised]
☐ Fruit ☐ Rice ☐ Grain
☐ Grapes ☐ Hops ☐ Alfalfa

and there have just been issued new Pump and Plow Catalogs which we will be glad to send prospective buyers.

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(Formerly The Yuba Construction Company—change in name only)

Bean Power Sprayers

Known Wherever Good Fruit Grows The World Over

Bean Power Sprayers break the liquid up into a fine mist and drive the spray material onto the trees at tremendous pressure—so that it reaches every crack and crevice—and does the work thoroughly and completely.

Hundreds of Orchardists throughout the Northwest use the Bean because they know that Bean spraying insures a big healthy yield of profitable fruit.

Bean Power Sprayers have ten big exclusive features not found on other sprayers—the results of over thirty years' experience in the manufacture of spraying machinery.

INVESTIGATE THESE BIG FEATURES BEFORE YOU DECIDE ON A SPRAYER

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Porcelain-Lined Cylinders

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Underneath Suction

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Write today for illustrated catalog of Hand and Power Sprayers, Spray Hose and Accessories.

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behavior of this apple disease in the West a careful study of the ascospore activity (the source of primary spring infection) was carried on by the writer in 1916. The investigation definitely proves that an application is very essential in this locality before the "pink application" in order to keep the disease in check.

The observations were carried on in the field under normal orchard conditions. Ordinary microscope slides, upon which a little glycerine jelly was applied, were placed over leaves bearing scab infections. The slides were examined daily for a period of more than three and one-half months. It was found that the spore discharge from the fallen leaves began much earlier and extended over a much

longer period than has been previously reported. The first spores were observed to be discharged on March 20. At this time fruit buds in early varieties of apples were just beginning to burst; in later varieties no green tissue was present. The last ascospores obtained was on June 27, or more than three months later than the initial discharge. The records that have been obtained show the correlation existing between discharge and the weather conditions occurring during this period.

This ascospore activity has a very direct bearing upon the control of apple scab and it seems quite possible that in other sections, during some seasons at least, ascospores are discharged at a much earlier date than supposed, and which has resulted in occasional

years of very poor scab control. A complete report of this investigation will be published in the near future.

The Southern Pacific Company is sending out an announcement made by the president, William Sproule, who has just returned from New York, that plans have been made for the Southern Pacific Company to build all its wooden freight cars, such as box cars and flat cars, at their own shops, and that they will be made from lumber produced along the lines of the Southern Pacific. The policy is to favor the lumber industry of the Pacific Coast. They further state in the near future, as soon as possible, they will build 2,000 box cars, 450 stock cars, 500 flat cars, which, added to 2,700 new refrigerator cars just ordered by the Pacific Fruit Express Company, of which 1,000 will be built in California, will give the Southern Pacific Company 5,650 new freight cars during the coming season. This should be very interesting information for the fruitgrowers and farmers, particularly after the recent car shortage of the past season.

The Ninth National Apple Show held in Spokane, November 20th to 25th, featured more prominently than ever before the Growers' Conference, in which many of the vital problems of interest to the fruitgrowers were discussed thoroughly and instructively. Many of the addresses, with discussions following, contained very valuable information. Practically all of the papers with the discussions will be given in future editions of "Better Fruit," as space will permit. These will appear in "Better Fruit" at opportune times in advance of the season when the different subjects will command the growers' attention.

F. E. Myers & Bros., Ashland, Ohio, one of the large manufacturers of spray outfits, are showing their interest in their employes by recently taking out insurance policies covering all their employes.

By-Products Plant Wanted

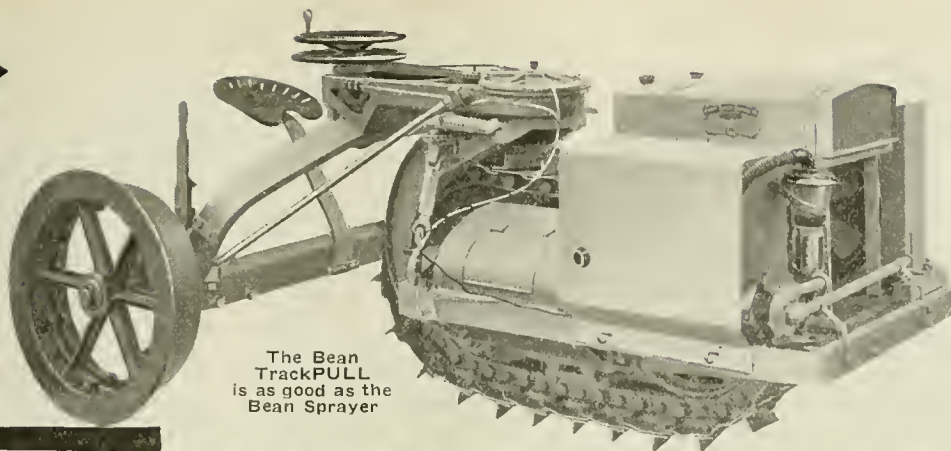
Editor Better Fruit:

The people of Lewiston Orchards are desirous of finding some way to prevent the immense waste of cull fruit that has thus far prevailed in this district, and hereby appeal to you, as the publisher of the leading fruit journal in the Northwest, to aid them in giving publicity to their needs in the matter.

This is a district having over 5,000 acres of planted apple orchards, more than one-half of which are already in bearing, the oldest being now in their eleventh year of growth. The cull apples from the present year's crop are estimated at 2,500 tons. Last year, with about the same amount of cull fruit, the greater part went to waste from lack of by-products facilities. Some portion was shipped to outside points, but this necessitated a haul of from four to eight miles to the cars, which are reached by a paved highway leading from Lewiston through the district.

The situation seems favorable for the immediate establishment here of a vinegar factory, an evaporating plant and a cider manufactory. It is believed that the growers would largely join in any movement that appeared to be upon a sound basis, and which afforded them a controlling interest. They would be pleased to receive propositions from parties who are prepared to organize and operate such plants of the right kind. Any further information wanted as to the situation will be given upon request. Your truly, H. H. S. Rowell, for Lewiston Orchards Assembly, Lewiston, Idaho.

Does the
Work of
Six Horses



The Little
King
of Orchard
Tractors

The Bean
TrackPULL
is as good as the
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ORCHARDISTS—LOOK

The Wonderful Little Bean TrackPULL Six-Horse Tractor

The Bean TrackPULL combines giant strength with light weight and long traction. Just think of a tractor so small that it will go under limbs only 4 feet off the ground and will work right up close to the trees and between anything that grows in rows only 7 feet apart.

That's what the Bean TrackPULL does. It will do your plowing, your cultivating and your discing, and then run stationary machinery when it is not working in the field.

It actually does the work of six horses on what it would cost you to feed one team, and you can work it 24 hours a day if you want to.

The Ideal Orchard Tractor

The Bean TrackPULL plows or cultivates closer to trees than a team. Makes little difference how far off center you hitch. Goes under the branches of trees no team can get under—turns inside of a 10-foot circle.

It will save you money by saving you cost of man labor and by doing more and better work in less time than it takes for horses to do it. It will do your heavy work when you want it done. It will not be affected by heat or insects. It will cultivate deep in hot weather.

Costs nothing to maintain when idle. Furnishes a large unit of power at your command day or night.

The Bean TrackPULL pulls instead of pushes itself along. It lays its own track on which it pulls. This wide track offers much less resistance than a rear drive tractor that sinks in and packs the soil.

The TrackPULL packs the soil less than a man's foot when he walks, and is therefore especially adapted to cultivating. It has full power on turns as well as on the straightaway.

Best Construction—Lasts Longest

The Bean TrackPULL Six-Horse Tractor is built in one size only—6 h.p. at drawbar and 10 h.p. at belt—and weighs only 2,875

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The motor is a Le Roi 4-cylinder vertical type—4 cycle. Equipped with Donaldson air clarifier—Bosch ignition—Water cooled with centrifugal pump, also fan. Combination pump and splash lubricating system.

The famous Hyatt roller bearings used in track wheel and sprocket and in track rollers. There are six New Departure ball bearings in the transmission. Running in grease and dustproof. Gears are steel. Not a plain bearing in entire transmission.

Prompt Deliveries in April

We are behind on orders and are working night and day. We have started work on a large addition to our plant to increase our capacity and will be able to make prompt shipments in April.

Find Out Now—Mail the Coupon Today

We will gladly send you our folder telling you more about the Bean TrackPULL Six-Horse Tractor, and what it will do for you.

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This or This

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San Jose, California.

Please send me prices and the big folder with the complete story of the BEAN TrackPULL.

Name
St. or R.F.D.
City
County
State

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HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
Made Payable to

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

The Importance of Tractors.—A few years ago when the crop of apples in the Northwest was comparatively small and prices relatively high, very little attention was paid to the matter of economy in the cost of production or harvesting. In 1910, when the Northwest apple growers had the first jolt in the way of lesser prices, the editor realized that the high prices realized in previous years would not continue to maintain. The editor started the ball rolling with investigation on this subject, pertaining particularly to harvesting, publishing an editorial on that subject in December, 1910, showing his own harvesting cost to be 41½ cents per box, which commanded universal attention and resulted in many growers introducing methods of efficiency, including grading machines, so that the cost has been greatly reduced. In 1915 the editor's cost was reduced to 31.97 cents per box, which seemed to be a pretty fair general average. The movement resulted in the reduction of about 25 per cent, or about 9 cents per box. This movement created interest in other features, in the cost of production. A little over a year ago Professor C. I. Lewis, Horticulturist, Oregon Agricultural College, published a most excellent bulletin, entitled "The Economics of Orchardng," including in this cultivation. In June, 1915, Mr. Langdon, of the Langdon-Baker Orchard of Walla Walla, Washington, contributed an article on the "Economy of Tractors in Connection With Cultivation." Since then tractors have commanded considerable attention on the part of orchardists, more particularly the large orchardists, it having been ascertained that by the use of tractors the cost of cultivating can be materially reduced. Equally important with reduction of cost in connection with cultivation is the fact that in the spring the soil dries out very rapidly; therefore cultivation must be done quickly in order to con-

serve the moisture, particularly in districts which are not amply supplied with irrigation water, in order to keep the fruit crop growing throughout the season. The moisture condition is far more important in orcharding than in most kinds of farming, because a large number of farm products grow into maturity early in the summer before the moisture is completely exhausted, whereas apples practically continue to grow throughout the entire summer, in fact up to harvesting time in October and November. Tractors present a solution of the problem of cultivation in two ways, reducing the cost and enabling the fruitgrower to do his cultivating in a short space of time, conserving the moisture thoroughly and quickly, leaving the balance of the fruitgrower's time to be devoted to spraying and other important orchard problems that come along throughout the entire season. The minimum unit or acreage which will justify investing in a tractor has not been definitely ascertained, so far as the editor knows. Of course it must be admitted the cost on a small acreage would be excessive, consequently it seems well to suggest that, whereas community graders and community packing houses have been successful in not only reducing the cost of packing, but resulting in a more uniform packing, it looks reasonable to suppose that a community plan in reference to tractors would be practical and successful. We fruitgrowers realize the necessity of economy in production in every way possible. Now that the matter of economy is well under way on the cost of harvesting, the editor suggests that the fruitgrowers endeavor to introduce more economy methods pertaining to cultivation and other problems.

Advertising the Apple.—The success obtained by the Northwestern Fruit Exchange in advertising the Skookum brand in 1914 was so satisfactory that the fund was increased for 1915. Again, even more satisfactory results were obtained and the 1915 campaign being so successful that the Northwestern Fruit Exchange created a fund of somewhere in the neighborhood of \$75,000 for the 1916 campaign, which proved the value of advertising beyond any argument. In 1915 the Hood River Apple Growers' Association put on a moderate advertising campaign, the result being so satisfactory that the Board of Directors felt justified in recommending a more comprehensive campaign for 1916, amounting to approximately \$30,000. This campaign for Blue Diamond brand has been carried on principally in New York City, San Francisco and Los Angeles, comprising newspaper advertising, street-car advertising, booklets, receipt books and calendars. The results of the Northwestern Fruit Exchange advertising and the Hood River Apple Growers' Association advertising in the year 1916 have been so effective in creating a demand for these popular brands that all those who have kept well informed feel justified in this progressive movement of creating a wider demand,

it being a well-known fact that a strong demand means firmer prices. By that is meant firm prices under existing market conditions, taking into consideration the effect of the natural law of supply, demand, competition, etc. The Yakima Fruit District Association has been watching the advertising campaign that has been carried on during the past two or three years very closely, and at a recent meeting took steps to create a fund for advertising by making a charge of 5 cents per box to advertise the "Y" brand throughout the United States. These three concerns and the North Pacific Fruit Distributors handle the largest tonnage of any of the marketing organizations in the Northwest. Their experience and judgment therefore should be very convincing. There is no getting around the fact that an immense demand has been created by advertising for many brands of articles and products. Advertising has been tried out and proved successful for Northwestern brands of apples to such a degree and so successfully that the fruitgrower should be willing to contribute a reasonable sum per box for the purpose of creating a still wider demand and a greater consumption, both of which mean firmer prices and generally better prices.

Zero Cold Test for Motor Oils.—A very interesting article on this subject has been prepared by P. R. Melchert, automobile engineer of the Standard Oil Company. The space in "Better Fruit" is limited. The vital problems connected with fruit growing usually take up so much space that many other important articles must necessarily be condensed. The main features in the article are that the users of motor oils on automobile engines and machinery which are operated in cold climates should first use an oil that will stand a cold test, in accordance with the climate in which they operate. If an oil has a cold test of 30 degrees it will pour at that temperature, but becomes solid at about five degrees lower. Oils that congeal when the weather is at freezing are therefore not suitable for lubricating purposes where such temperatures prevail. Every man operating an engine knows that it starts hard in cold weather, which is due to the fact that the fuel does not vaporize as readily during the cold weather as it does during the warm. This condition taxes the light batteries to their limit. If an oil is used that makes a poor cold test an additional power is necessary to turn the motor over, which is a constant drain upon the batteries, meaning an expensive upkeep. If an oil is used with an insufficient cold test it will not lubricate the motor correctly, because the oil will be too thick and sluggish to pass between the close-fitting bearings, and if used in a motor which is lubricated by splashing the oil it will not be splashed properly through the cylinders, pistons and wrist pins in adequate quantity for lubrication until the motor has been run fifteen or twenty minutes, and the temperature of the motor has thinned the oil down so it will begin to operate



The Light Draft

Orchardists everywhere are telling us that the Light Draft is the most effective of all orchard harrows. The Light Draft is an application of the springtooth in a new way.

WEIGHT CARRIED ON WHEELS.

Two broad-tired wheels are used on the Light Draft Harrow and the weight is so distributed as to be carried almost entirely on these wheels. This enables us to give you a harrow of good width without requiring greater horsepower.

STEEL FRAME.

The Light Draft comes very nearly being all steel construction throughout. The frame is steel and very liberally braced. The gangs are operated independently and easily.

FINE FOR ORCHARD WORK.

On account of its extension feature, which enables the ground to be worked right up to the trunk while the driver and team are in the clear, the Light Draft will do better work in the orchard.

HIGH GRADE SPRING TEETH.

Made of best grade spring steel and extra long. Note the manner in which they are arranged to permit working in trash.

YOU NEED THE LIGHT DRAFT.

It will cut your cultivation by enabling you to get over more ground in less time and with fewer horses. Ask for our free booklet, "Modern Orchard Tillage."

TWO HARROWS for Orchard Work

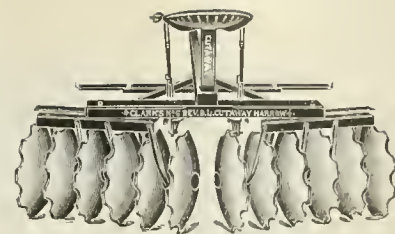
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The Cutaway

In the line of disc harrows there is nothing equal to the slotted disc Cutaway.

ACTS LIKE A SPADE.

The Cutaway slotted disc gives you the effect of a spade. It does not run through the soil as does the smooth disc, but digs it up and moves it in such a manner that none is left unpulverized.

FORGED DISC.

The discs on the Cutaway are forged and they stay sharp a longer time than the ordinary disc. The Cutaway has real dustproof bearings. The Cutaway bearings are exceptionally wide and there are plenty of them.

GENERAL CONSTRUCTION GOOD.

The Cutaway is strongly built throughout and designed to give years of hard service. We carry the Cutaway in many styles, including the Double Action Cutaway Harrows, the original and best of all double gang harrows. Send for our book, "Intensive Cultivation."

satisfactorily, which means excessive wear. On account of this difficulty Eastern refiners and motor-car manufacturers recommend a light oil for winter and a medium oil for summer because light Eastern oils have a better cold test than the heavy-bodied Eastern oils. Motor oils properly manufactured from California asphalt base crude have a natural zero cold test, making them much more satisfactory for use during the season when low temperatures prevail.

The Apple Crop Compared With Other Products of the Soil.—There are only seven crops, apples being the eighth, which exceed in valuation the apple crop. We give them in their order, as follows: Corn, wheat, oats, barley, potatoes, hay and cotton. The strange fact in connection with the valuation and prices of all other products of the soil in 1916, compared with 1915, is that rice is the only product of

the soil which sold at a lower price than last year with the exception of box apples.

Buying Early.—Prices on nearly all articles have been constantly advancing ever since the war began, and very rapidly during the last few months. There is no immediate prospect of the war stopping suddenly, and even if it does there seems to be a good reason to assume that it would be some time before the existing shortage could be made up, which must take place before prices will be very much lower. The car shortage is another serious problem at the present time, and in view of the probability that prices will not be less and the possibility it may be difficult to get supplies, it seems wise to suggest to the fruitgrower that they purchase promptly this season's requirements in the way of orchard tools, sprayers and other materials which they must necessarily use throughout the season.

Increasing the Market by Wider Distribution

ADVANCED thinkers and progressive marketing people for some time have realized the folly of the old method of selling the bulk of the apple crop of the Northwest in a few large cities, and have been favoring more extensive marketing, believing that if a sufficiently large number of small cities, towns and villages were sold that the consumption of Northwestern

apples could be increased,—with pressure relieved in the big centers much better prices could be obtained. A pioneer in this line of work has been the Northwestern Fruit Exchange. Some shippers have hesitated about giving a list of the towns which they sold, fearing it would invite competition. The progressive marketers have felt that by so doing it would stimulate

other marketing concerns to reach out for the small cities, towns and villages, and if successful in so doing the extra volume of business obtained from these small cities would be so much withdrawn from the big cities, relieving the pressure and enabling the Northwest marketing concerns to secure better prices. It is a universally recognized fact when markets are glutted prices are low. The editor of "Better Fruit" has favored this plan for many years, advocating it universally. A list of towns was published by the Fruit Growers' Agency, giving the towns to which members had shipped during the season of 1916, showing 460 towns on the list for the month of November, an increase of about sixty towns over the month of October. The large number of towns reached by the Northwestern Fruit Exchange indicates that the crop has been spread out more extensively than ever before. For the first time in several years the big cities have not been congested or glutted with apples. Much better prices have prevailed in 1916, although the crop is the largest in the history of the business, than were obtained in 1912 and 1914, the previous big-crop years. Through Mr. W. F. Gwin, vice-president and manager, the Northwestern Fruit Exchange has given some publications a list of towns shipped to, which "Better Fruit" is pleased to publish in this edition. This list gives the number of cities and towns sold in the United States and foreign, by the Northwestern Fruit Exchange during the years 1910 to 1916,

CORONA DRY

Arsenate of Lead
Patented June 30, 1913

The "Standard" for Convenience, Economy, Efficiency

One Pound of "Corona Dry" Does the Work of Three Pounds of Paste Arsenate and Does It Better

QUICKLY AND EASILY MIXED—No working up; no straining needed; no sediment; no lumps; no waste—*never clogs nozzles.*

No evaporation—no leaks—no loss of strength. But an *absolutely standard spray mixture*, the uniform strength of which you can depend upon—and know that you have the *highest per cent of killing power.*

"Corona" is safe—it will not burn foliage.

SOLD IN NET WEIGHT PACKAGES
200 lbs., 100 lbs., 50 lbs., 25 lbs., 5 lbs., 1 lb.

REMEMBER—"Corona Dry" means—No guess work, but a Standardized Spray in which the Mixture is Always the Same Strength and Efficiency

MANUFACTURED BY

Corona Chemical Company, Milwaukee, Wisconsin

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Trade Mark

Special Notice

A STANDARD product of distinct and unquestioned superiority is always imitated with inferior grades by rival manufacturers. The indications are that this practice will be quite general in the production of Dry Powdered Arsenate of Lead. The use of new, inferior and untried brands is fraught with danger and dissatisfaction.

"Corona Dry" is the only brand that large and practical usage in every section of the country has proved unequaled as a spraying material. We know our good customers will continue to use only "Corona Dry" and we urge you to do the same. Accept no imitations or substitutes, but insist on "Corona."

Corona Chemical Co.

Sole Makers

"Corona Dry"

inclusive, up to December 28. The editor has no hesitancy in saying this is good constructive work. It is building for the future. In addition to this, the editor believes there are still hundreds of cities in the United States that can be sold that will use Northwestern box apples, and furthermore believes that when a sufficient number of cities are sold and the crop spread out thin enough over the United States there will be no trouble in marketing Northwestern box apples at satisfactory and profitable prices to growers.—Editor.

List of Markets Used by Northwestern Fruit Exchange

Seasons 1910, 1911, 1912, 1913, 1914, 1915 and 1916 (to December 28).

UNITED STATES

Alabama—Birmingham, Montgomery, Mobile, Selma.
Arkansas—Jonesboro, Little Rock, Texarkana, Ft. Smith.
Arizona—Bisbee, Douglas, Globe, Phoenix.
California—Bakersfield, Fresno, Los Angeles, Oakland, Pasadena, Richmond, Sacramento, San Diego, San Francisco, Santa Anna, Stockton.
Colorado—Boulder, Colorado Springs, Denver, Haxtun, La Mar, Pueblo, Sterling, Trinidad.
Connecticut—Bridgeport, Hartford, New London, Stamford, Waterbury.
District of Columbia—Washington.
Florida—Jacksonville, Tampa.
Georgia—Atlanta, Augusta, La Grande, Macon, Rome.
Illinois—Bloomington, Champaign, Chicago, Decatur, Freeport, Peoria, Rockford.
Idaho—Lewiston, Pocatello, Wallace.
Indiana—Evansville, Indianapolis, Muncie.
Iowa—Burlington, Cedar Rapids, Clinton, Council Bluffs, Davenport, DeMoines, Dubuque, Fort Dodge, Keokuk, Marshalltown, Mason City, Oelwein, Ottumwa, Sioux City, Strawberry Point, Walcott, Waterloo.

Kansas—Anthony, Arkansas City, Bazine, Beloit, Bison, Brownell, Clay Center, Clifton, Coffeyville, Columbus, Concordia, Dodge City, Eldorado, Emporia, Fort Scott, Great Bend, Herington, Hoisington, Hoxie, Hutchinson, Independence, Jamestown, Kansas City, Kingsley, Lawrence, Luray, Manhattan, Marion, McPherson, Morganville, Morland, Neodesha, Ness City, Oakley, Olpe, Osborne, Ottawa, Parsons, Phillipsburg, Pittsburg, Protection, Salina, Scott City, Sterling, Topeka, Wakefield and Wichita.

Kentucky—Lexington, Louisville.
Louisiana—Alexandria, De Ridder, Lake Charles, New Orleans, Shreveport.
Maine—Bangor, Ft. Fairfield, Portland, Rockland.

Massachusetts—Boston, Fitchburg, Lawrence, Lowell, Springfield, Worcester.
Maryland—Baltimore.
Michigan—Detroit.

Minnesota—Albert Lea, Alexandria, Brainerd, Breckenridge, Crookston, Dilworth, Fergus Falls, Duluth, Glenwood, Graceville, Henning, Mankato, Minneapolis, Moorehead, North Redwood, Redwood Falls, St. Cloud, St. Paul, Thief River Falls, Wadena, Wilmar, Winona.
Mississippi—Hattiesburg, Jackson, Meridian.
Missouri—Carthage, Joplin, Kansas City, St. Joseph, St. Louis.

Montana—Bainville, Baker, Big Sandy, Billings, Boyer, Bozeman, Bryan, Buffalo, Butte, Cascade, Conrad, Culbertson, Cutbank, Fairview, Gilford, Glasgow, Glendive, Great Falls, Havre, Helena, Hinsdale, Homestead, Lewistown, Livingston, Medicine Lake, Miles City, Missoula, Plentywood, Poplar, Roundup, Scooby, Sidney, Westby, Whitetail, Winifred, Wolf Point.

Nebraska—Crawford, Crete, Fremont, Grand Island, Hastings, Holdrege, Hyannis, Kimball, Lewiston, Lincoln, McCook, Mitchell, Omaha.
New Hampshire—Manchester.
New York—Albany, Buffalo, Elmira, Ithaca, New York City, Syracuse, Wilson.

North Dakota—Alexander, Antler, Anamoose, Arnegard, Arthur, Beach, Berthold, Bismark, Bowbells, Carrington, Charbonneau, Crosby, Devil's Lake, Dickinson, Drake, Fargo, Finley, Grafton, Grand Forks, Hamlet, Hampden, Jamestown, Keene, Leeds, Lignite, Lishon, Medina, Minot, Noonan, Plaza, Portal, Powers Lake, Rock Lake, Rugby, Stanley, Tioga, Towner, Valley City, White Earth, Wildrose, Williston, Wolfard, New Rockford.

Ohio—Akron, Bellefontaine, Cleveland, Cincinnati, Columbus, Dayton, Marietta, Newark, Toledo, Youngstown.

Oklahoma—Alva, Ardmore, Chickasha, Clinton, Duncan, Durant, El Reno, Enid, Guthrie, Hobart, Hugo, Lawton, McAlester, Miami, Muskogee, Okima, Oklahoma City, Purcell, Sapulpa, Shawnee, Tulsa, Woodward.

Oregon—Astoria, East Portland, Portland.
Pennsylvania—Altoona, Philadelphia, Pittsburg, Scranton, Wilkesbarre.

Rhode Island—Providence.
South Dakota—Aberdeen, Browning, Deadwood, Gettysburg, Huron, Kodoka, Mitchell, Rapid City, Redfield, Sioux Falls, Watertown.

Texas—Abilene, Amarillo, Austin, Ballinger, Beaumont, Big Springs, Bonham, Brownsville, Bowie, Brownwood, Cameron, Cisco, Cleburne, Comanche, Corpus Christi, Corsicana, Crockett, Curo, Houston, Lockdale, Lockhart, Marshall, Mexia, Nacogdoches, Navasota, Palestine, Paris, Plainview, Rockdale, San Antonio, San Augustine, Sherman, Stanford, Sulphur Springs, Sweetwater, Dalhart, Dallas, Dennison, El Paso, Fort Worth, Gainesville, Galveston, Greenville, Hillsboro, Taylor, Temple, Tyler, Victoria, Waco, Waurika, Waxahachie, Wichita Falls.

Tennessee—Chattanooga, Knoxville, Memphis, Nashville.

Utah—Brigham City, Salt Lake City.
Virginia—Norfolk, Portsmouth, Richmond.
Washington—Bellingham, Chehalis, Everett, Puyallup, Seattle, Spokane, Sumner, Tacoma.

Wisconsin—Baron, Osceola, Eau Claire, La Crosse, Milwaukee, Oshkosh, Oshkosh, Rice Lake, Rhinelander.

West Virginia—Charleston, Clarksburg, Hinton, Wheeler.

Wyoming—Basin, Casper, Cheyenne, Cody, Douglas, Gurnsey, Laramie, Bawlings, Sheridan, Thermopolis.

FOREIGN

Canada—Alberta, Brandon, Brantford, Calgary, Edmonton, Lethbridge, Medicine Hat, Montreal, Moose Jaw, New Westminster, North Battleford, North Bay, Ottawa, Prince Albert, Prince Rupert, Regina, Saskatoon, St. John, Swift Current, Toronto, Vancouver, Victoria, Weyburn, Winnipeg, Yorkton.

China—Hong Kong.
Cuba—Havana.
Denmark—Copenhagen.
England—Bedford, Birmingham, Brentford, Brighton, Croydon, Eastbourne, Hastings, Hull,

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tern asphalt-base crude can be made not only equal but superior to paraffine-base oils.

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Holland—Rotterdam.
Ireland—Belfast, Dublin.
Philippine Islands—Manila.
Russia—Vladivostok.
Scotland—Glasgow.
Sweden—Gottenborg, Stockholm.
Wales—Cardiff.
Australia—Auckland, Melbourne, Sydney.
South America—Buenos Aires, Montevideo.
South Africa—Bulawayo, Cape Town, Durban, Johannesburg, Port Elizabeth.
Foreign markets, 70.

Cuba	1
Denmark	1
England	20
Germany (for redistribution)	3
Holland	1
Ireland	2
Philippine Islands	1
Russia	1
Scotland	1
South Africa	5
South America	2
Sweden	2
Wales	1
Total	484

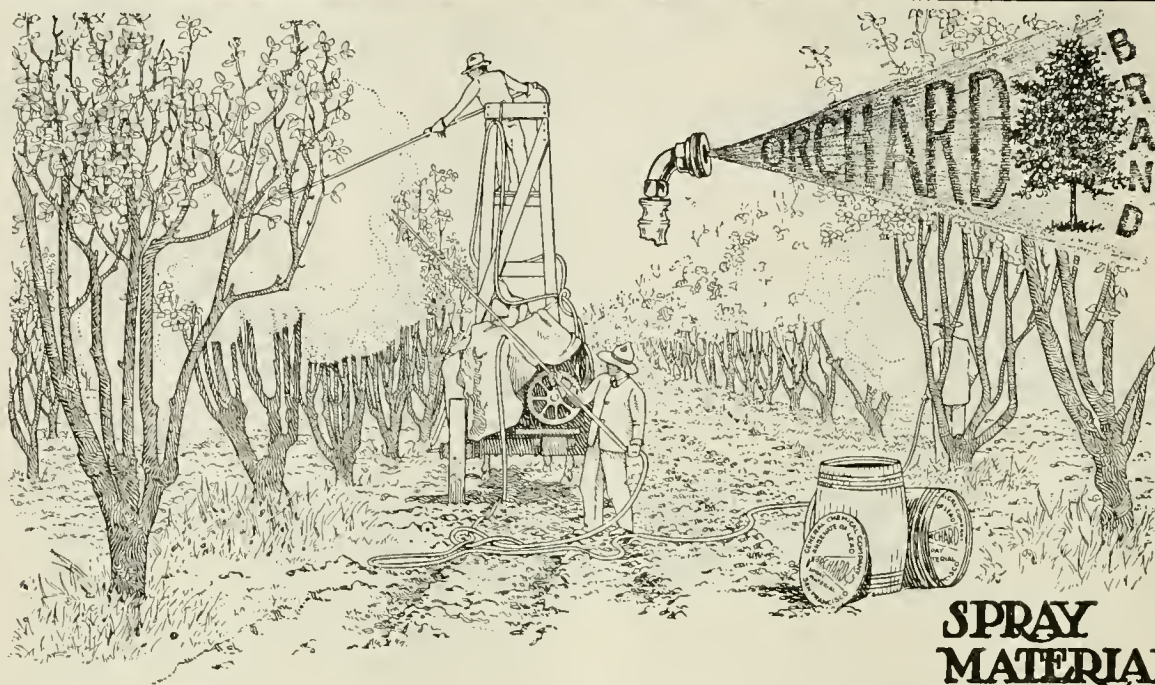
Farm Life More Attractive

Some of the high-class magazines that investigated the national problems are calling attention to the fact that

there is a decrease in the movement of boys and girls on the farm to city life. It is a pleasure to note that such a change is taking place. Among some of the reasons for this change are mentioned the improved conditions in country life now as compared with country life a few years ago. Many fruit and farming districts are supplied with interurban car lines, which enable the boys and girls to go to the local towns frequently, taking in the social events that occur in these small cities, which they were unable to do in the past. Good roads and, by the way, automobiles that are being rapidly bought by

SUMMARY

United States	414
Canada	25
Australia	3
China	1



Orchard Brand products are manufactured with a thorough knowledge of the diseases and of the chemical and physical properties of the materials necessary to produce the required effects. This is the result of scientific study, laboratory and field investigations covering many years. They are the most efficient and consequently the most eco-

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The use of **Orchard Brand** products gives the fruit grower the advantage of quick deliveries, fresh materials, minimum freight rates, prompt service, uniform prices, and definite and correct directions for their application.

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Balfour, Guthrie & Co., Portland, Ore.

Rogue River Co-Operative Fruit Growers' Association, Medford, Ore.

C. J. Sinsel, Boise, Idaho

Morgan, McKaig & Co., North Yakima, Wash.

Wells & Wade, Wenatchee, Wash.

Samuel Loney & Co., Walla Walla, Wash.

McGowan Brothers Hardware Co., Spokane, Wash.

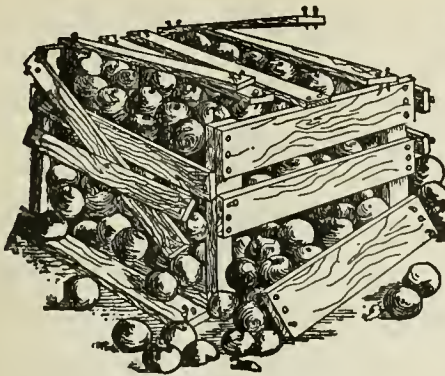
fruitgrowers and farmers are other factors. It is prophesied by many that in the near future practically every fruitgrower and farmer will own an automobile, as a combined business and pleasure proposition. Telephones add much to country life, doing away with much lonesomeness. Drudgery is removed by electricity—electricity doing away with the old-style lamps and the work of cleaning them. In addition to this there are individual plants which farmers can buy at a very reasonable figure, for lighting the house, where the district is not supplied with electricity. Of these an immense number are sold.

In addition to this electricity on the farm is a factor of great importance in the way of power. Many farmers and fruitgrowers nowadays have washing machines, sewing machines, feed cutters, wood-saw outfits and fruit-grading machines, all of which are run by electric power.

The apple crop of the Northwest for 1916 was about double any previous year in the history of the business. Crops overran estimates of even the most conservative estimators. Some growers had double their estimates. An apple crop is a hard crop to guess.

Good estimates can only be made through careful work. Every fruitgrower should endeavor to train himself along this line.

The Northwest apple crop is a bumper crop this year. In fact growers never had such crop before. They had all kinds of difficulties—shortage of paper, boxes; shortage of help and various other troubles. As Mr. J. R. Nunamacher expressed it, "The fruitgrowers of the Northwest never had a large crop before, and therefore did not know how to handle the 1916 crop." In future years they will know better.



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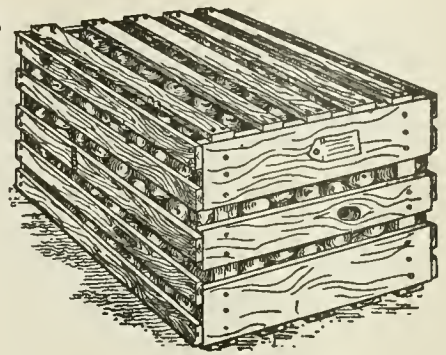
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

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Accident Prevention Means Lower Insurance

By Carle Abrams, Member of the State Industrial Accident Commission

SINCE the State Industrial Accident Commission announced last July that a rate of 2 per cent had been made for general farming, and that application from farmers for the portection of the Compensation Act would be accepted, several hundred farmers have taken advantage of the Act and more farmers are coming in each day. The Commission has now declared an exemption of payments for February, and those who have paid into the fund for the preceding six months will have their insurance carried free during February. A similar exemption was made last July. This makes two exemptions for this fiscal year, which begins July 1, and is a reduction in the rate of 16% per cent.

Those farmers as well as all other employers working under the Act, who have a good accident experience for the year, requiring the Commission to pay out for accidents to their workmen, not to exceed 50 per cent of that employers contribution, will be granted a reduction in their rate of 10 per cent. This will bring the farmers' rate down to \$1.80 on each \$100 of payroll. For those whose accident experience is as good for the second year, will receive a second reduction of 10 per cent in their rate on July 1, 1917, bringing the rate down to \$1.60 on each \$100 of payroll. These reductions are in addition to exemptions. The rate for those farmers paying 2 per cent this year is, therefore, after deducting two months' exemptions (one-sixth of the entire year), \$1.667 for each \$100 of payroll. After July 1, 1916, those that earn 10 per cent reduction will pay only \$1.50, and one year later this should be reduced to \$1.35, a very low rate indeed, provided the same monthly exemptions are then possible.

The state contributes sufficient money to the fund to pay all expenses of administering the fund, therefore every dollar paid by employers and workmen is available to be paid back to injured workmen for hospital and medical attention and for time lost. The rate the employers pay bears a direct ratio to the number of accidents. There are no leaks, no profits and no commissions

to pay. Accidents only are paid for. Reduce the number of accidents and the rate of payment to the fund will be reduced by additional exemptions.

The records of this Commission show that last year one of each eight workmen employed in hazardous occupations in Oregon were injured. This is too high a percentage. By co-operation of employers and workmen to prevent accidents the Commission believes that the number of injuries can be cut in half. That means cutting the rate in half, by reductions and exemptions, and the farmer would then be paying less than 1 per cent. No farmer in Oregon can afford to carry the risk of injuring or killing workmen when he can thus receive insurance with the absolute protection of the state at actual cost, and be given also the opportunity of constantly reducing his rate.

In view of the above, the Commission has issued a call to employers and workmen of Oregon to co-operate in a movement to prevent accidents, and will conduct an active campaign of accident prevention. The results desired can only be accomplished by co-operation of both employers and workmen with the state and will result in a vast

saving in money, and an increase in efficiency of manufacturing and other operations through preventing loss of time and the necessity of replacing injured workmen who are experienced with inexperienced men. What is more important still, it will prevent untold suffering to the thousands of workmen who are now annually torn and mangled, many of them made wrecks for life, while toiling to earn their daily bread.

Estimates on Crops Are Important

If every fruitgrower had made a reasonably correct estimate of his crop this year he would not have found himself short of help, paper, boxes, etc. A man must have the proper idea of the volume of business to be done in order to provide proper facilities for taking care of his business.

"Poultry Breeding and Management" is the title of a new book edited by Professor Dryden of the Oregon Agricultural College, Corvallis, whose fame as a successful, practical, scientific poultryman is well known, especially throughout the Northwest. Anyone who is interested in poultry will find this a very valuable book. Published by the Orange Judd Company of New York.



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MIDLAND, MICHIGAN

treat old stock when the weather is damp, they should be kept in for two or three days. Never wait until the hens are lousy before treating them. the easiest and surest way to keep lice down is never to allow them to get a start. Treat every three or four months. One pound of blue ointment properly applied will treat five to six hundred hens. A pound of blue ointment should not cost more than \$1.25.

It is necessary to treat mites differently, as they stay on the fowls only while the fowls are on the perches, or on the hens while brooding. Paint the perches with some coal tar preparation, such as kresol, zenoleum, Lee's Lice Killer, or any other of the coal-tar preparations. We find the following solution to be the very best: 50 per cent tallow, 25 per cent kerosene, 25 per cent coal-tar preparation. The solution should be heated to the boiling point, thoroughly mixed and applied while hot. We use an ordinary paint brush and paint the perches, dropping boards and all around the roosting chamber, up as high as the fowls are likely to touch. If the mites are kept out of the place where the fowls roost, they can do no damage. The first warm days of spring is the time for the first application. If they are not allowed to get a start during summer, there will be none to bother during winter. Plenty of sunlight, clean houses and roosting quarters will do much in keeping down lice and mites. Whitewash, too, should be used freely. There should be no dark corners about the poultry house. Cleanliness and sunlight are hard on lice and mites. Many poultry diseases are the result of attacks of lice and mites.

An ounce of prevention is worth a pound of cure. This is an old adage and a true one. Particularly is it true when referring to poultry ailments. The best treatment for sick fowls is the axe. It is seldom profitable to attempt treatment of sick fowls. Their commercial value is not great enough to justify treatment. Their usefulness as producers or breeders is usually destroyed by the ailment. Provide conditions that will prevent the possibility of diseases. Sanitation is the secret. Sanitation means clean soil, proper housing and proper feeding. Clean soil is to keep fowls on fresh land where possible. Allow them a large free range. If it is not possible to keep fowls on fresh land or large range the yards should be cultivated and crops grown, such as oats, corn and sunflowers. Proper housing is to so construct houses that they afford plenty of sunshine and ventilation and yet protect the fowls from drafts. Proper feeding means an assortment of clean, well-prepared food. It also means plenty of fresh, pure water in clean drinking fountains. Running water is all the better.

Disinfect to kill lice and mites. Disinfection also kills disease germs. Do not allow sick or dead fowls to lie about the farm or yards. Fowls are natural scavengers. Decomposed foods of any kind are serious. Ptomain poisoning (known as limber neck in fowls) is usually the result of decomposed foods.

Keep Fowls Free from Lice, Mites and Disease

By Pren Moore, Poultry Husbandman, University of Idaho, College of Agriculture

LICE and mites are the greatest enemies of the poultry industry. Millions of dollars are sapped from the business by these little blood suckers. There is no time that a poultryman can feel certain that they are not robbing him. The extent to which they rob him depends upon the efforts he puts forth to keep them down.

Lice are on the fowls continually and they are usually found on the head, under the wings and around the vent. A splendid treatment for lice is blue

ointment. Apply about the amount of a kernel of wheat on the head (just back of the comb) under each wing and around the vent. The treatment should be applied three or four times each year. If blue ointment is used on little chicks, it should be used very sparingly. The amount required for one old hen is enough to treat a dozen little chicks. Chicks should always be treated on a bright, sunny morning; never at night or evening. All fowls should be treated during bright weather. If necessary to

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Warns without fail.

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BEST &
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PORTLAND, OREGON.

A treatment for ptomain poisoning is one tablespoonful of castor oil and one-fifth-grain doses of sulphate of strychnine, the latter to be given every four to six hours until the fowl is relieved.

There will be few sick fowls when conditions are correct. Sealy leg can be successfully treated with lard and kerosene. The formula is a tablespoonful of kerosene to a half teacup of lard. Two or three applications will usually clean the legs. Aspergillosis is a disease caused by feeding mouldy grains or feeding in mouldy straw used as litter. The only remedy is to remove the cause. There is no treatment for the disease. Bumble foot is a swelling of the feet which develops bunions on the bottom of the feet. The cause is jumping from high perches.

There is always danger of contagious diseases, such as roup, cholera, chickenpox and calarrh. The danger is greatly reduced when fowls are in proper physical condition. Thrifty fowls are almost immune from diseases. Diseases are in all cases more easily prevented than cured.

Closer Commercial Relation

An exchange of professors between the School of Commerce of the University of Oregon and some one of the universities of South America is the plan of H. B. Miller, director of the department of commercial and industrial survey. The plan is intended to bring about a closer commercial relation between Oregon and South American countries through the medium of education. It will be presented to the university regents by Professor P. L. Campbell. "Ignorance always means prejudice and lost opportunities. Knowledge is the beginning of trade as well as of friendship," is the way President Campbell puts it, realizing that one of the duties of the School of Commerce is to further the prosperity of the state in every way that is within the province of an educational institution of this kind.

The intention is that the man who will come here from South America shall be conversant with the commercial trade and possibilities of trade and the natural resources and manufactured products of his part of the world, with special reference to the demands of the Pacific Northwest, and particularly of Oregon, and that he shall instruct the students of the School of Commerce along lines of commercial development of the relations between Oregon and South America. In addition, he will teach business Spanish, the more or less technical phraseology of trade and trading. Conversely, the man who will go from the School of Commerce of the University of Oregon will have made a detailed study of all those products of Oregon for which a South American trade can be developed. This knowledge he will transmit to the university to which he is credited, as well as teach commercial English there.

The School of Commerce believes this exchange of instructors to be one of the most practical and efficient methods of developing commercial relations with

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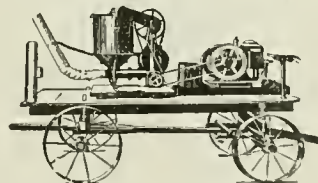
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other countries. The man sent from the School of Commerce to South America first will go on a trip throughout the state to make a detailed study of the lumber, paper, box-making and furniture factories, fruit canneries and dryers, flour mills, meat packing plants and other of the leading industries, that he may be prepared to call the attention of the importers and business men of the South American states to Oregon trade possibilities. He also will be instructed to study the products of the South American state to which he goes, especially those that may be imported



If He'd Kept Bees

the man who said business and pleasure never mix would have known better. Or perhaps he lived too long ago. It's the honey-bee, plus modern methods and the increasing demand for honey that accounts for present-day

Big Profits in Bee-keeping

Wherever you are, you can start right in with bees—for business, or pleasure, or both. There's keen enjoyment to be had out in the sunshine, studying their wonderful colony organization. They earn from \$2 to \$10 per colony, according to locality and care; and one experienced apiarist can handle 500 colonies. Write to us for particulars, and get our

Special Offer Or, if you're a going bee-keeper, we want to tell you about our double-walled Buckeye hive in which the bees winter so well, and our gentler, hardier strains of queen bees. For better prices, use the Root clear glass jars, honey-comb cartons, section honey boxes, shipping cases and labels.

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Mr. C. B. Hill, Oak Point, Washington, writes:—"I hear nothing but praise of the nursery stock you have shipped this fall."

Similar statements are received from scores of customers in different sections, which proves that planters recognize and appreciate the high standard of **ORENCO TREES** and the fresh, vigorous condition in which they are received.

ORENCO TREES are sold only by our own salesmen and shipped direct from our nursery, reaching you in a fresh, vigorous and healthy condition. **ORENCO TREES** are **NOT** handled through dealers. You may buy scrubby trees for less money, but you can't buy **BETTER** trees for more money.

Don't fail to get our prices on Superior Orenco Trees on any list, small or large, you may need.

Consultation and advice perfectly free and willingly given.

Orenco Nursery Company
Orenco, Oregon

A Salesman's Position Now Open
Write for Particulars

Paint Without Oil

Remarkable Discovery That Cuts Down
the Cost of Paint Seventy-
Five Per Cent.

A Free Trial Package Is Mailed to
Everyone Who Writes.

A. L. Rice, a prominent manufacturer of Adams, N. Y., has discovered a process of making a new kind of paint without the use of oil. He calls it Powderpaint. It comes in the form of a dry powder and all that is required is cold water to make a paint weather proof, fire proof, sanitary and durable for outside or inside painting. It is the cement principle applied to paint. It adheres to any surface, wood, stone or brick, spreads and looks like oil paint and costs about one-fourth as much.

Write to Mr. A. L. Rice, manufacturer, 78 North Street, Adams, N. Y., and he will send you a free trial package, also color card and full information showing you how you can save a good many dollars. Write today.

into the Northwest; and also to familiarize himself with the banking methods and houses and business concerns with which business is likely to be developed. In other words, he becomes the commercial agent of the School of Commerce to develop and improve Oregon commercial relations, as well as to give instruction in the English language.

The instructor in Spanish who will come here will be asked to meet the various representatives of trade in Oregon through the Chamber of Commerce of Portland, and will become an adviser to the Bureau of Trade and Commerce of that Chamber in matters pertaining to trade in the territory from which he comes.

After the return of the representative from Oregon he will be asked to meet the business men of the state through the Portland Chamber of Commerce, to give them the benefit of his investigations.

The Transportation of Trees

The transplanting of trees is always accompanied by some danger of loss or backset because of loss of feeding roots, drying of the bark of the roots, thus making activity impossible; or failure on the part of the planter to make the soil firm around the roots and thereby prevent wind injury to newly-formed rootlets.

Immediately upon receipt of trees, if they are moist and in good condition, heel-in in moist soil. If the roots are dry and the top shriveled, bury top, roots and all in moist soil for a few days before planting. This will frequently save trees when ordinary treatment would not.

When ready to plant dig the holes large enough to accommodate the roots without cramping and deep enough so that when the tree is transplanted it will stand from one to two inches deeper than in the nursery. Prune off all injured or bruised parts of the roots so that the cut ends will rest on the bottom of the hole or will face downward. Place the tree in the hole so that it rests firmly on the bottom; fill in with moist, rich soil until the hole is from one-third to one-half full, or until the roots are thoroughly covered, shake the tree slightly to work the soil among the roots, and then get into the hole and tramp the soil until it is "firm." If it is impossible to "firm" it with the feet, use a piece of 2x4 six to eight feet long, the end of which should be padded. Fill the hole and leave the surface loose and smooth, but never cloddy or covered with chunks of sod.

If water is to be used it is best to dig the holes one or two days before planting and put from two gallons or more of water in each hole, permitting it to soak away before planting. Never apply water to the surface of the ground around trees after they are transplanted, as it will do more harm than good.

The roots of deciduous trees may become very dry and yet not suffer serious injury, but evergreens must never be permitted to dry, as they have a resinous sap which hardens when it



IT TAKES 400,000 cars to carry American Fertilizers to Farmers and Planters every season. Forty per cent. of this is useless Filler requiring 160,000 cars! Insist on having less Filler and all high grades with Available Nitrogen, namely:

Nitrate of Soda

and thus cut freight bills.

Crop production from such Fertilizers means greater outboard tonnage for roads and bigger purchasing power for Farmers. Railroads and everybody would benefit.

Larger food crops thus grown would give increased prosperity to all. It is up to you, Mr. Farmer.

Send for "Cost of Available Nitrogen"

DR. WM. S. MYERS

Director, Chilean Nitrate Propaganda
25 Madison Avenue New York
NO BRANCH OFFICES

BUY AND TRY

White River Flour

MAKES

Whiter, Lighter
Bread



The simplest spray pump made. No suction. No packing to wear out. Pressure of 115 pounds can be reached. Use in bucket, keg or barrel.

Will Spray Any Liquid

Any disinfecting fluid, whitewash, water color paint or crude oil can be used in this pump. No sediment can get in. Your mixture can not settle—the pump keeps it agitated. Nothing to break or wear out. Strong materials. Weight 18 pounds. Write today for full description. Dealers wanted where not represented.

Peoria Hydraulic Pump Co.
Peoria, Illinois

dries out or comes in contact with the air. This kills the trees.

Evergreen trees can be transplanted almost any month of the year, but best results are obtained by transplanting just as the buds begin to expand, usually form the tenth of April to the first of May, or right after the spring growth has hardened, from the middle to the last of July. Deciduous trees must be transplanted during the fall or very early in the spring. Late spring planting in Eastern Washington is not satisfactory on account of the long, dry summer.—W. S. Thornber, Director of Extension Department, State College of Washington.

"Semi-Centennial History of the Patrons of Husbandry," by Thomas Clark Atkeson, Master of the West Virginia State Grange and Past Overseer of the National Grange, published by the Orange Judd Company, is a very interesting book, dealing with the history and development of the Grange movement. Illustrated with full-page illustrations of men who have been prominent in the development of Grange work, something every man connected with Granges and farmers will find instructive as well as interesting.

"Skookum" Apples

Three years ago the Northwestern Fruit Exchange introduced the "Skookum" brand to Eastern purchasers and consumers of Northwestern apples. The name made a hit on account of its oddity. Nobody knew what the word meant, consequently it commanded immediate attention. People began to wonder. Later an educational advertising campaign followed, giving a definition of the word and origin. The word "Skookum" is an Indian word and stands for good, best, and signifies goodness to the fullest extent. The Indian language has very few words and very few adjectives, consequently the word "Skookum" was the one word for the best quality without any superfluous adjectives. The Northwestern Fruit Exchange hit upon a very popular idea in the adoption of the word "Skookum." The first year the Northwestern Fruit Exchange spent a little money. The campaign was successful. The second year, while the exact figures are not known by the writer, probably somewhere from \$15,000 to \$20,000 was spent. The 1915 campaign was a decided success, so that in 1916 a big national campaign was adopted, and it was reported that in 1916 in the neighborhood of \$75,000, possibly more, was used in advertising this brand. Advertisements have appeared in a large number of the national magazines like the Saturday Evening Post, the Literary Digest, the American, Good Housekeeping, and others. This has been supplemented with street car advertising, consequently nearly everyone throughout the East and Middle West has become familiar with "Skookum" apples, grown in the Northwest. The campaign has been a big factor in creating an additional demand and a

greater consumption for Northwestern apples.

The word "Skookum" has been very catchy. This is evidenced by the fact that a number of dealers have appropriated the idea originated by the Northwestern Fruit Exchange. One New York department store advertised "Skookum" socks, "Skookum" shirt waists, and "Skookum" boys' clothing. A number of doll manufacturers in the United States, including the makers of the Campbell Kids, the Flick Kids and

Sis Hopkins, have been competing for the privilege of putting out a "Skookum" doll in 1917. The doll manufacturers have agreed to make an exact reproduction of the "Skookum" Indian girl in the doll, which will be put on the market next year for the youngsters for Christmas. The doll will be sold through jobbers and traveling men all over the United States.

Another hit has been scored in advertising the "Skookum" brand of apples with the Hotel Belleclaire of

FRUIT-FOG

Adds Thousands of Dollars To Fruit Profits!

The Scientifically atomized SUPER-SPRAY produced by Hayes Sprayers

Gets Hidden Pests!

Saves Time—Saves Solution

Fruit-Fog envelopes everything with a fog of solution—works in and around, up and down. Seeps into most minute crevices. No hidden pest or disease can escape it.

HAYES HAND AND POWER SPRAYERS

Fruit-Fog deposits a thin film of solution—which instantly adheres. No danger to foliage! No drops form to run away, as with low-pressure sprays! Only a small amount of solution necessary. Big loss saved. Nozzle capacity greatly increased. This means utmost speed with thoroughness. Perfect control and clean sound fruit is the result.

Find out about **Fruit-Fog** at once. Mail the coupon below.

Guaranteed Hayes Power Sprayers are tested to 500 lbs. pressure and **GUARANTEED** to maintain 300 lbs. working pressure at full rated capacities. We make 50 styles of large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, painting, farm, home and garden use.

Spraying Guide FREE Also interesting book on Fruit - Fog and our big 64-page catalog. All free if you check and mail coupon.

HAYES PUMP & PLANTER CO.
Dept. K, Galva, Illinois



COUPON

Hayes Pump & Planter Co.
Dept. K, Galva, Illinois

Please send Spraying Guide, book on **Fruit-Fog** and 64-page catalog. I am interested in

☐ Hand Sprayers ☐ Power Sprayers ☐ Nozzles and Fittings

Name.....

Address.....



Write Today for These Free Apple Booklets

Every Apple Grower should have them. Makes no difference whether you have a big orchard or only two or three trees. Tells you how to keep your trees free from Aphids, Red Bug and other insects that are proving more dangerous to orchards than scale or blight. You must kill and control Aphids with

Black Leaf 40—Kills by Contact

Equally effective when used separately or with other sprays as directed. Endorsed and recommended by Experiment Stations and Agricultural Colleges, and **guaranteed** by the manufacturers. Don't delay. Get these books at once. This is the time to control Aphids. One killed now equals thousands later on. We will also send you a valuable Spraying Chart telling just when to spray. You who are interested in Vegetables, Flowers, or Fruit other than Apples should write us for literature on these subjects.

The Kentucky Tobacco Product Co.
Incorporated Louisville, Kentucky

Black Leaf 40

Kills Aphids

40% Nicotine

HURST SPRAYERS Have Stood the Test for 30 Years

Because of Their Simplicity and Durability

And these are the first things you should insist upon in the sprayer you use. Demand more than a guarantee. Pick the sprayer so constructed that it will be ready to use when you want it without first making repairs.

Thirty years of successful manufacturing experience has taught us how to eliminate the weaknesses of the ordinary sprayer. The Hurst has the fewest parts; is the most easily accessible; is free from bunglesome mechanism; is built for real hard service; and because of all of these things, it lasts the longest and gives you the best value. We have 40 different styles.

Write today to our Western Branch and ask for special prices.

The H. L. Hurst Mfg. Co.

264 Front Street

PORTLAND, OREGON

D. J. FOOTE, Western Manager

Factory: Canton, Ohio



Acme Power Sprayer

of the mountains. Some of these walnut trees are now quite old and have been bearing good crops for a number of years. Those who have investigated find that in many sections east of the mountains, like the ones referred to, there are many walnut trees scattered here and there throughout the different districts. In these districts are found the Franquette and Mayette varieties, which are two of the best quality nuts among the English walnuts. While the editor is not prepared to say that walnuts grown east of the mountains would be a success in a commercial way he feels justified in suggesting that it would be well for every fruitgrower to plant a few walnut trees, at least for home use. If his crop should be more than he could consume at home, there is always a ready market for them in the cities at very satisfactory prices, as the varieties referred to usually sell at wholesale from 20 to 25 cents per pound.

900% INCREASE IN APPLE PRODUCTION

was obtained through careful experiments conducted on selected plots in the Hood River Valley by the application of

Nitrate of Soda

"The Best, Cheapest and Most Available Source of Nitrogen."

The results were preceded by an improved character of blossoms, increased fruit set, wonderful tree vigor and great terminal growth.

Perhaps, under your own conditions, you could not get so large a percentage, but if you obtained 100%, 200% or 300% would it not make the use of Nitrate worth your while? Certainly, and you can do it.

Early March is the Time

when Nitrate of Soda will exert the most beneficial influence on tree growth and production. Don't miss your great opportunity.

Write us at once for further information and literature.

NITRATE AGENCIES CO.

Leary Building, SEATTLE

New York, located on 77th Street and Broadway. This hotel is making a specialty of serving apple pies to its guests, and in addition has a delivery service for supplying its famous apple pies to all families of the city. The "Skookum" apple pie is featured on the menu of this hotel, and in addition the "Skookum" brand of apple pie is featured in the advertising campaigns of this hotel.

Another success has been scored with the dining-car service of several Eastern roads, which are now using "Skookum" Northwestern apples. Among the

users of "Skookum" apples in their dining-car service may be mentioned the Western Pacific, The Delaware, Lackawanna & Western, Chicago, Milwaukee & St. Paul, and Denver & Rio Grande.

For a long time walnuts have been grown successfully in the Willamette Valley in a commercial way, where there are many good-sized walnut groves. In the early days a few walnut trees were planted in the more rigorous climates like Yakima and Hood River Valleys, and other sections east

New Machine for Testing

A machine for testing the strength of boxes has been devised by engineers of the Forest Service and is in use at the Forest Products Laboratory at Madison, Wisconsin. The machine is the result of experiments made to determine a fair test for all types of boxes. A series of tests in co-operation with the American Society for Testing Materials and the National Association of Box Manufacturers has been carried on during the past year to determine the strength of boxes of various woods and of different construction. Over four and a half billion feet of lumber is used for box making every year, and on this account the tests are considered important. Moreover, big losses are caused by the breakage of boxes in transit, and all parties concerned are said to be anxious to determine the best kind of box. The machine consists of a hexagonal drum with 3½-foot sides, which is lined with thin steel sheets. Pieces of scantling bolted to the bottom form what are known as "hazards".

In making the tests boxes filled with cans containing water are placed in the drum, which is then rotated. For convenience in observing the results of the tests, the sides and ends of the box are numbered with large figures, and in addition other numbers are placed at specified points on each side. The "hazards" cause the boxes to be carried part way around and then dropped back to the lower level of the drum. Each fall of this sort is a pretty fair imitation of the probable treatment it would receive in shipment. The boxes are watched carefully, and notes are taken on the manner in which they give way and the number of falls required to break them in pieces. In this way, say the officials who have conducted the tests, it is possible to determine what kinds of woods are best suited for boxes. The tests showed a decided need for a standard classification of box woods, and three groups have been made, based on the data which was obtained.

The tests also show the best methods of box construction. The experts say that one of the most striking things brought out was the inadequacy of the ordinary methods of nailing up boxes. The number of nails used and the way they are put in are important. One nail more to the side of a box will give it a great deal more strength than might be thought. The nails should not be driven too deep into the wood. In many cases, it is said, proper nailing will allow a reduction of the amount of lumber used without any decrease in the value of the box. Boxes with cleated ends were found to be much stronger than those without cleats. As a result of the tests made at the Forest Products Laboratory, tentative specifications for boxes used in shipment of canned goods have been drawn up and submitted to the various parties interested, for discussion.—Forest Service, United States Department of Agriculture.

Car Shortage

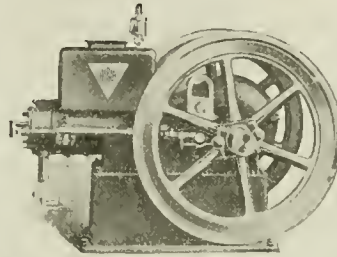
On account of the immense increase in business the United States has suffered from lack of adequate car service to move the crops of the farmers and fruitgrowers and all other industries. It takes time to build cars. Relief in this way, therefore, will be slow. Consequently railroads have urged all shippers to be prompt in loading cars and equally prompt in unloading. Most excellent advice, which should be followed by every shipper, because in doing so he will not only help himself but everybody else as well.

The editor of "Better Fruit" has very carefully estimated his crop each year by taking tree-to-tree estimate. In addition to this the editor has his orchard listed in eight blocks, according to age and varieties. A record is kept of the number of boxes harvested from each block of each variety each season. Then the editor makes a careful estimate of the percentage of the increase or decrease in each block, adding up the total, compares it with the total estimate, tree by tree, then takes the average of the two for the estimate for the coming season. This method has been very successful, in fact so successful that the editor's estimate only varied about 10 per cent during 1914-1915 from the actual crop harvested. In 1916 the actual number of boxes shipped was ten boxes over the estimate made. Every grower can do just as well as the editor of "Better Fruit" if he will take the pains and the trouble to train himself in this line of work.

"Judging Farm Animals," by Charles S. Plumb, Professor Animal Husbandry in the College of Agriculture of Ohio State University, is a very interesting and valuable publication, the illustrations showing how to judge quality in all kinds of farm animals like horses, cows, sheep, pigs, etc. The information is of great value to every fruit-grower or farmer. Published by Orange Judd Company of New York.

ECONOMICAL PUMPING

Can Only Be Accomplished by the Use of Efficient Pumping Equipment



Alpha, Self-Contained, Hopper Cooled Engine Make Efficient, Reliable Pumping Plants

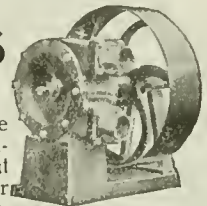
All Alpha Engines are equipped with a high-class, built-in, gear-driven magneto; they start on the magneto without cranking and the use of batteries and coils is entirely eliminated. Built in all sizes from 1½ to 100 H. P.

VIKING ROTARY PUMPS

An Ideal Irrigation Pump

Viking Pumps will deliver more water per minute for the same amount of power used than any other type. Its very high efficiency is due to its positive delivery, correct design and careful manufacture. It is SELF-PRIMING, requiring no foot valve or priming pump and is easy to install. Investigate the Viking Pump.

Built in capacities from 20 to 1,600 gallons per minute.



Viking Rotary Pump

Send for complete catalog of both Alpha Engines and Viking Rotary Pumps. They are yours for the asking. Now is the time to consider pumping equipment.

De Laval Dairy Supply Co.

Agencies in All Pacific Coast Territories 101 Drumm St., SAN FRANCISCO

for WINTER SPRAYING

**Diamond
Spra-Sulphur
Solution**

A dry compound that quickly dissolves—and stays in solution. Will not clog or cut nozzles. Superior form of sulphur for destroying San Jose and other scale insects, and all fungus diseases controllable in the dormant season.

100 lbs. Spra-Sulphur (dry) equals a 600-pound barrel of lime-sulphur solution—and no freight to pay on the water.

Scalecide

The Best Miscible Oil Spray for San Jose Scale and soft-bodied sucking insects. Contains a powerful fungicide. A dormant season spray.

for SUMMER SPRAYING

**Corona
Arsenate of
Lead**

Contains only Arsenic and lead oxides. No fillers. Easy and quick to mix. Stays mixed longer and sticks better to branches, leaves and fruit than any other arsenate. Always uniform strength. Cannot freeze. Highest percentage killing power. No sediment, no lumps, no waste.

**Gould's
Spray Pumps**

We are general agents for the Gould Spray-pumps, guaranteed to be the best built, most lasting and of the highest efficiency. They are the recognized standard. Send for our special booklet, listing all kinds and giving full data.

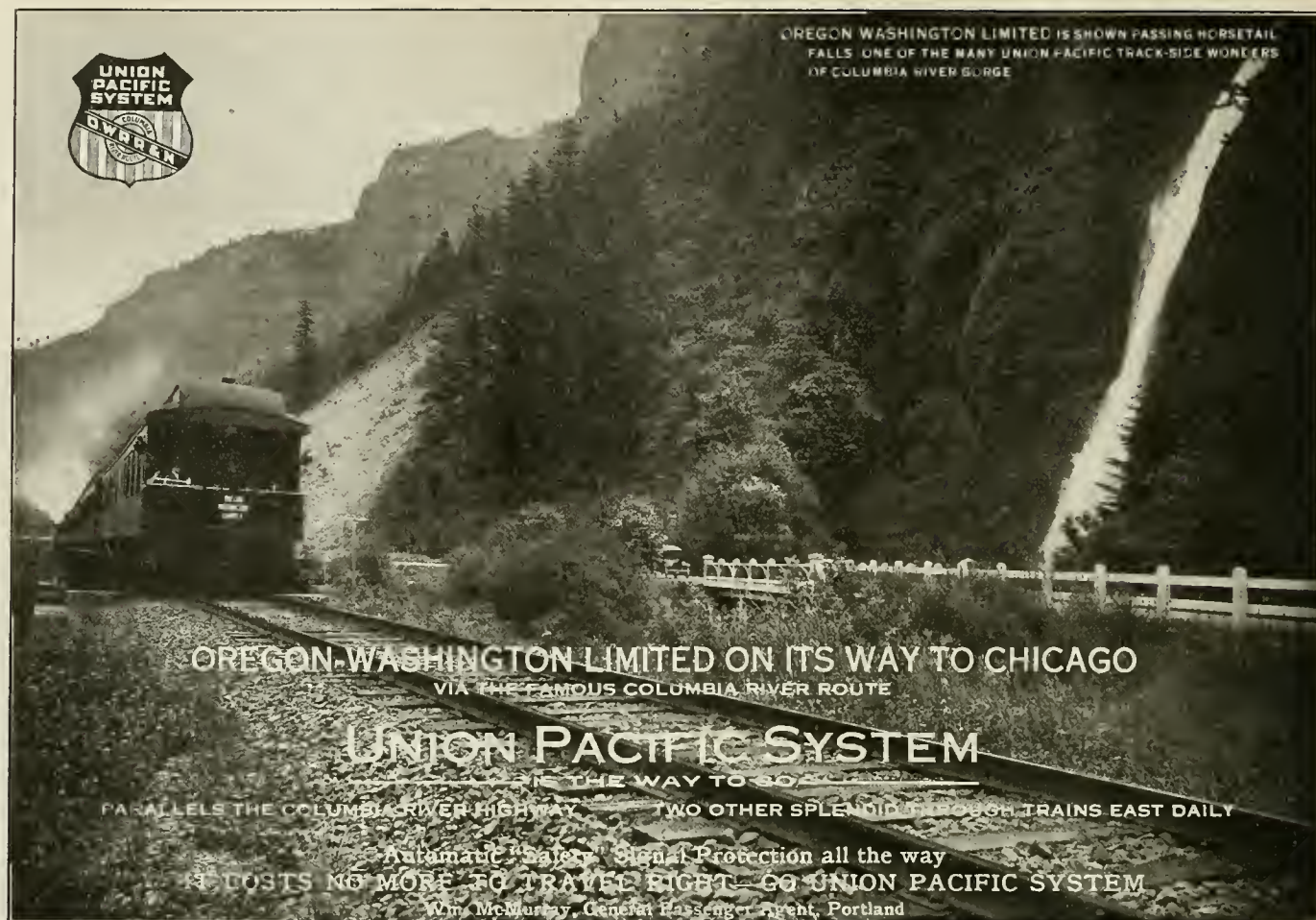
Our 1917
Catalog

164 pages listing the best of everything for Home and Market Gardens, Orchards, Poultrymen and Bee Keepers—is a dependable reference and a safe guide to your purchases. Ask for Catalog No. 200

PORTLAND SEED COMPANY

PORTLAND, OREGON





UNION PACIFIC SYSTEM

OREGON WASHINGTON LIMITED IS SHOWN PASSING HORSETAIL FALLS, ONE OF THE MANY UNION PACIFIC TRACK-SIDE WONERS OF COLUMBIA RIVER GORGE

OREGON-WASHINGTON LIMITED ON ITS WAY TO CHICAGO
VIA THE FAMOUS COLUMBIA RIVER ROUTE

UNION PACIFIC SYSTEM

PARALLELS THE COLUMBIA RIVER HIGHWAY TWO OTHER SPLENDID THROUGH TRAINS EAST DAILY

Automatic "Safety" Signal Protection all the way
IT COSTS NO MORE TO TRAVEL RIGHT—GO UNION PACIFIC SYSTEM
Wm. McMurray, General Passenger Agent, Portland

The De Laval Dairy & Separator Company announce that after January 1st, 1917, their Seattle branch office will consolidate with the San Francisco office, creating a larger and more efficient office and sales organization for the entire Pacific Coast. In order to care for the large business of Oregon, Washington and Idaho stocks will be carried at Seattle and Portland as in the past, of their separators, Alpha Engines, Acme Feed Cutters, etc. Mr. J. V. Shepard, extensively known throughout the Northwest, has been transferred from the Seattle office to San Francisco and will continue to act as sales manager for the Northwest territory.

"Modern Fruit Marketing," by Bliss S. Brown, Professor of Horticulture in the University of Maine, is quite a complete treatise on the harvesting and marketing of fruit crops, with several chapters on selling methods and fruit organizations. It covers all the modern phases of harvesting, with splendid illustrations of the different kinds of equipment that are necessary in harvesting the apple crop, either box or barrel. Published by the Orange Judd Company of New York.

The Montana State Horticultural meeting was held at Plains, Montana, January 23 to 25. Montana usually holds a splendid meeting with a lot of splendid addresses on important subjects to fruitgrowers in that state particularly.

Profits in Early Spring Tillage

Plowing and disking should begin as soon as the soil is in good tillage condition. By this practice two distinct benefits are realized in the semi-arid sections of the state, viz., moisture conservation and the establishment of a granular mulch. In the more humid sections early tillage increases the length of the nitrification period, it aerates the soil and conserves moisture. The results of this practice will insure additional crop yields over late tillage operations. The greatest loss of moisture occurs in the early spring, when the soil is saturated with moisture. Henry Holtz, of the Washington Experiment Station, Pullman, gives the results of an experiment showing the inches of water evaporated from soils containing different percentages of soil moisture.

Per cent of soil moisture	Inches of moisture evaporated in 24 days
12 .....	.27
18 .....	.40
24	2.16
30	4.25

The moisture in the soil at the time when tillage operations may begin is about 24 to 26 per cent. The above table shows an evaporation of about 3.5 inches in 24 days, or approximately one inch each week. Where moisture is the limiting factor, the conservation of one inch of rainfall is equal to about two and a half bushels of wheat per acre, or its equivalent in other crops. A soil that has a one or two-inch mulch

will lose only one-fourth to one-eighth as much water as a soil untilled.

Early plowing develops more available nitrogen and produces a larger crop than late plowing. An experimental field at Pullman contained four summer-fallowed plots, two plowed and tilled early (April 5) and two late (June 10). The plots tilled early developed 497 pounds of nitrates and yielded 47.7 bushels of wheat per acre. The plots tilled late developed 338 pounds of nitrates and yielded 34.6 bushels per acre, or a decrease of 13.1 bushels of wheat per acre. Considering the expense of operation, taxes, etc., \$12 per acre for the late spring tillage and \$14 for the early spring tillage, with the price of wheat at \$1 per bushel, there would be a net return of \$33.70 for the early and \$22.60 for the late tillage plots, or a difference of \$11.10 in favor of early tillage.—Bulletin of State Agricultural Experiment Station, Pullman, Washington.

The Massachusetts Fruit Growers' Association held their convention in Springfield, Massachusetts, January 9-12, inclusive. This is one of the most progressive fruitgrowers' associations in any of the Eastern States.

The Mt. Arbor Nursery, Shenandoah, Iowa, has recently incorporated with capital stock of \$300,000. Mr. E. S. Welch, who has been at the head of the institution since 1891, has been selected as president.

Cost of Operations and Returns

Continued from page 8

Manufacturing costs would approximate 2.7 cents per dry pound, or \$6.75 per ton of fruit used. Deducting these amounts from \$18.50, we would have in the first case—that of the general purpose dryer with a long working season—\$13.00, in the second case \$11.75. From these amounts the operator must obtain his profits—my estimates of manufacturing costs include a reasonable salary for his services as general superintendent of the plant—and pay the grower for the fruit used. If we allow the operator of the plant 10 per cent of the gross returns as his profit, and make a further deduction of \$1.85 from each of these amounts, we have remaining \$11.15 and \$9.90. These sums do not represent the amounts which growers may expect to receive from their fruit, for two reasons: in order that he evaporator may have assurance of such supplies of material as will keep the plant running at capacity throughout each season, he must usually contract with growers for his supplies for a term of years in advance, and must therefore protect himself against the possibility of a future more or less permanent decline in the price of his product; also, he must provide a sinking fund to meet the expense of carrying his product in storage over an occasional year of overproduction and consequent temporary disorganization of the market. After these contingencies are provided for, it will be seen that the grower may legitimately expect a price of \$9.00 to \$10.00 per ton for his cull fruit upon contracts extending over a term of years. A well-equipped plant might profitably pay an additional \$1.00 per ton for packing-house culls of uniform size, reasonably free from imperfections, since there would be made from these a product most of which would grade higher than prime and which could advantageously be packed in fancy cartons for the retail trade. In years of limited production in the Eastern evaporating districts, such as the present, the price paid to growers could advance proportionately as the price of prime dry stock rose above 6½ cents per pound on board cars at the point of origin, but \$10.00 per ton would seem to be an equitable valuation of the material, which will scarcely be materially altered by changes in market conditions for some years to come.

It seems to be generally agreed by the members of this conference that the annual production of culls in our bearing orchards is not far from 1½ tons per acre. This figure will of necessity be somewhat increased as the trees become older, but if we were able at present to fully utilize the unmarketable fruit through evaporation, the growers should realize approximately \$15.00 per acre from material which is at present wholly or practically wholly lost.

I wish to digress for a moment from the primary purpose of this article and to speak of the possibilities for evapo-

Turn Apple Waste to Profit

Many are Doing It Now.



Sizes 10 to 400 barrels daily. We also make cider evaporators, apple butter cookers, vinegar generators, filters, etc. All machinery is fully guaranteed. All power presses have steel beams and sills. Write Today for Catalog.

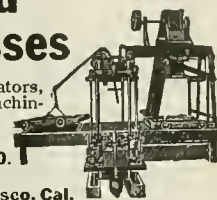
Hydraulic Press Manufacturing Co., 60 Lincoln Ave., Mount Gilead, O.

Pacific Coast Representatives

Berger & Carter Co., 17th and Mississippi Sts., San Francisco, Cal.

START a paying business that grows almost without effort. Thousands are making **Big Money** turning apple waste into profits for themselves and their neighbors by making **Good Marketable Cider** from windfalls, culls, undergrades, etc., on

Mount Gilead Hydraulic Cider Presses



Once Over!

Two diskings in one with a double-action harrow!

Cutaway (CLARK)

Disk Harrows and Plows

Save half the time and labor and have a better seedbed. Use a CUTAWAY (CLARK) Double Action Harrow. Its rigid main frame causes the rear disks to cut and turn all the land left by the fore disks—and with equal force. It will

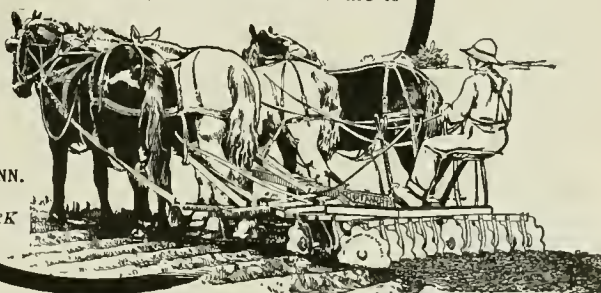
Quickly Cut, Pulverize and Level

the toughest plowed land. The CUTAWAY disks are of cutlery steel forged sharp—and they penetrate deep without bringing up stones and trash. Dustproof, oil-soaked, hardwood bearings and perfect balance make light draft. Tongue truck not required—close hitch. Many CUTAWAY (CLARK) Harrows in use 25 years and still giving splendid service. There's a CUTAWAY for every need and a size for every requirement. If your dealer has not the genuine CUTAWAY, write us direct. Be sure to send for our new free book, "The Soil and Its Tillage." Plan now for better crops.

THE CUTAWAY HARROW COMPANY

4013 MAIN STREET
HIGGANUM, CONN.

Maker of the original CLARK disk harrows and plows



Cabots Insulating Quilt

Best Insulation for Fruit Storage Houses

Building Papers, Roofing, Building Material, Paint
Gravity Box Conveyors

TIMMS, CRESS & CO., Inc., 184-6 Second St., Portland, Oregon

Lime-Sulphur Hydrometer

Price by mail with Test Jar and Instructions \$1.00
AGENTS WANTED EVERYWHERE

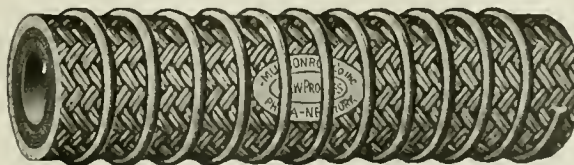


Used by all Progressive Fruit-Growers

Griebel Instrument Co., Carbondale, Pa.

New Process Protected Spray Hose

For Spraying, Painting, Whitewashing, etc.



LIGHT, STRONG, FLEXIBLE, CAN'T KINK, TWIST, BURST, COLLAPSE OR CHAFE

New Process Spray Hose, delivered, ¾-inch, per foot, 22c.

Plain three-ply braided Spray Hose, delivered, ¾-inch, per foot, 16c.

Manufactured by an entirely New Process. The result of 30 years' experience. Ask for folder.

Northwest Representative **J. W. GOEBEL, Salem, Oregon**
MULCONROY CO., Inc., PHILADELPHIA

Established 1887

Latimer's Dry



Powdered Arsenate of Lead

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ration as a possible solution for the problem presented by our inferior varieties. It has been clearly and conclusively shown in papers presented at this conference, and especially by the review of the whole situation which Mr. Sickles has given us, that this problem is a very real and pressing one and that nothing could do more to insure the successful future of the Northwestern apple industry than the immediate and permanent removal from the fresh-fruit market of a large number of varieties. At present, those varieties which Mr. Sickles has classified as consistently unprofitable make up very considerable percentages of the bearing acreage in every one of our commercial apple-growing districts, and the injury resulting to the industry from the annual overcrowding of the markets of our own territory with these low-priced apples has been very clearly pointed out. But to my mind a still more serious problem confronts the industry in the form of a still larger portion of the apple acreage which is planted to varieties characterized as doubtful. We must frankly face the fact that a very considerable number of these doubtful varieties owe their place in the doubtfully profitable group to the fact that, when grown under our conditions, their quality is distinctly inferior to that attained in other districts better suited to their production. Certainly no one can question the fact that the best Ben Davis produced in our territory is decidedly inferior to the Ben Davis of the Ozarks, that the Northern Spy of Michigan is much superior to our own, or that we cannot produce, even in the districts west of the Cascades, a Rhode Island Greening or a Baldwin which will compare favorably with those grown in New York and the New England States. One might go on to enumerate a large number of varieties which are so far unsuited to our conditions that their product cannot rank with that of districts peculiarly adapted to their best development, but it is superfluous to do so since every grower can make such a list for himself. In order to learn what varieties would give best results under the conditions prevailing in our newly developed orchard districts, practically every apple grower in the North American apple-growing territory has been planted more or less freely. We are emerging from this period of wholesale experimentation with the knowledge that the great majority of these apples, however excellent they may be elsewhere, can never attain more than mediocre quality under our conditions. It was absolutely necessary that we acquire this information, which could be obtained in no other way, and we are profiting by it, since the trend in the more recent plantings has everywhere been strongly toward the better varieties. In the meantime it can do no good to convince the consuming public that we can grow inferior fruit, but unless each of the apple-growing districts of the Northwest suppresses its unsuccessful experiments and reduces the number of its commercial varieties to not more than twelve or fifteen,

this is precisely what we are in a fair way to do. For practically every doubtfully profitable or distinctly unprofitable apple we grow is such because it is better when grown somewhere else, because it lacks some one or more of the essential qualities which have made Northwestern apples famous, and when placed upon the market it injures the industry by doing its share to destroy confidence in the superiority of our fruit in the minds of the ultimate consumer.

Some of the ways in which the marketing of this fruit harms the industry have already been pointed out in this conference, and I need not dwell upon the fact that it greatly restricts the sale of the choice varieties, overcrowds the markets, and forces down prices to the point of elimination of profits. But I have in mind another way in which it does an injury which is very possibly fully as widespread and as lasting as those already detailed to you, and I hope to bring this out in a word or two. I can find no better words in which to describe it than to characterize it as the alienation of the ultimate consumer.

Of that portion of the Northwestern apple crop sold outside of the producing territory, not more than one-third of extra fancy and fancy grades reach the hands of the ultimate consumer in the original package. The remainder are retailed to the purchaser by the half peck, pound or dozen through the agency of the itinerant vendor or pushcart man, the corner fruit store, and the sidewalk merchant. As a class these dealers have little sense of responsibility, less accurate information in regard to the fruits they handle, and none too much honesty. The average customer who buys extra fancy apples by the half dozen or dozen from the corner fruit store or the street vendor has heard of the high quality and unsurpassed flavor of Spitzenberg, Delicious, Jonathan, Winesap or Rome Beauty apples from Hood River or Wenatchee or Yakima, but of every one hundred such buyers not more than ten could identify three of these varieties with certainty. Herein lies the unscrupulous dealer's opportunity, and he utilizes it to make substitution of lower-priced varieties for the choicer ones to an extent which it is difficult to believe until one has personally investigated. I looked into this matter in hurried fashion last winter in Birmingham, Alabama, Atlanta, Georgia, Columbus, Ohio, Washington, D. C., Roches-



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ter and Buffalo, New York, and Chicago, Illinois. In these cities I found genuine Washington or Oregon apples in plenty upon the retail dealers' stands, but I also found Ben Davis, Gano, King David, Aiken Red, and two or three more low-priced red varieties masquerading as Esopus Spitzenberg, Rome Beauty, or Winesap, while Northern Spy, York Imperial, and some others which I was not sufficiently expert to identify with certainty were placarded as Delicious. This I saw not once or twice, but over and over again, so often that I am convinced that growers have no conception of the extent of such substitutions. And the result is everywhere the same; the consumer who has paid five cents each for Northern Spys or Ben Davis of mediocre quality in the belief that he was securing Delicious or Spitzenberg decides that if these are the choicest apples the Northwest can produce, he wants no more of them. As an actual or potential consumer of our fruit he ceases to exist, but he joins his voice with an already large chorus, the burden of whose song is that the Northwestern apple is a mediocre product, devoid of flavor, sugar and everything else but color, and that its producers are little better than holdup men.

This is not a trivial matter, since a large proportion of our better grades are delivered to the consumer under conditions which give opportunity for such substitutions. Nor is it a matter which can be controlled by pure food laws, since the most efficient enforcement of such laws cannot reach more than a small percentage of cases. It can be ended once for all by the removal of these varieties of fruit from a market in which they yield little or no profit directly to the grower while indirectly decreasing his profit on every acre of his better varieties. This can be done in some cases by top-working the trees to better varieties, although the expediency of top-working must be determined in every case only after thorough consideration of all the conditions. Where it is neither safe nor profitable to attempt it and the owner wishes to realize something from the trees while others are coming into bearing, there is another possibility which it has been the whole purpose of this departure from the main theme to suggest, namely: Many of



The Purpose

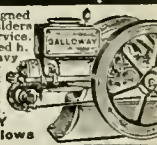
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these varieties make evaporated stock of the choicest quality, as for example Ben Davis, which makes a white fruit unequaled by any variety except possibly the Baldwin. Were the crop turned bodily into the evaporator, a very considerable share of the harvesting cost could be eliminated, and the operator of the drying plant could make a product a large part of which would grade as extra fancy and choice, hence could pay a price two or three dollars higher than that paid for culls. I have no expectation that this will be done in the immediate future, but I believe I foresee a time coming in which the continued crowding of these unprofitable varieties into the market will have hammered down the general level of apple prices to a point at which the grower will realize a larger profit from them when dried than when sold as fresh fruit, and it would be the part of wisdom to anticipate the inevitable and to take steps to meet it.

Will the evaporator or the vinegar plant handle culls with most profit to the grower? Vinegar making is the least profitable method of converting unmarketable fruit into marketable products. The market is limited by a generally low per capita consumption, which is not materially increasing and which is not capable of any material stimulation; the producer in our territory is handicapped by the bulkiness of his product, the great expense of rail transportation into consuming territory outside a narrow radius, and the strong competition of a product made from factory waste. The market is subject to great fluctuations, since every year of large apple crops in the Eastern or interior apple-growing regions is one of large overproduction of vinegar and consequent heavy decline in price. The business is also necessarily much more highly speculative than any other method of converting fruit into salable commodities, by reason of the long period which must intervene between the purchase of raw materials and the marketing of the finished product. There is no opportunity to judge of the probable state of the market when the goods are to be sold at the time the operator contracts for apples, and it is highly expensive to carry over marketable stock because deterioration is unavoidable. The experienced operator therefore recognizes that he must "play safe" while "going it blind" in

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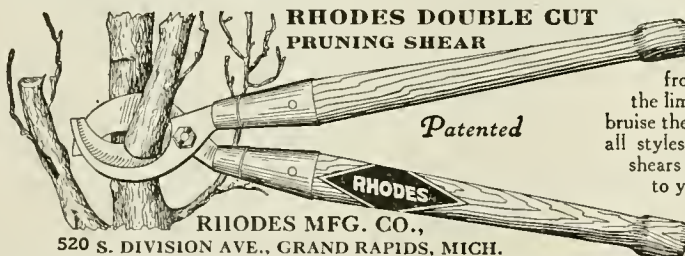
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The vinegar plant can make from one ton of average mixed varieties of culls 150 to 163 gallons of juice, which at prevailing prices for vinegar is worth, delivered into the tanks, not more than 7 cents per gallon. Deducting from this valuation a pressing cost of 1½ cents per gallon, we have as the maximum value of apples delivered at the plant not more than \$8.00 or \$9.00 per ton, and the equipment of the plant must be of the most efficient character and the losses in operation reduced to the lowest possible minimum if the operator gets this amount out of them. Consequently a price to the grower of more than \$7.50 a ton would in most cases seriously jeopardize the legitimate profit of the operator, while any utilization of the pomace, as by making of jellies, etc., from second pressings would not increase the potential value of the material more than 10 to 15 per cent.

The making of sterilized sweet cider is a valuable side line for either evaporator, cannery or vinegar plant. It can utilize considerable quantities of apples at \$8.00 or \$9.00 a ton, but it must be borne in mind that this business has distinct limitations and that the average operator cannot hope to extend his business beyond a very limited territory. The making of a satisfactory product is a task presenting considerable technical difficulty, and there is a strong probability that the business will consequently become centralized in a few large plants, properly equipped for handling large volumes of material economically and for making proper standardization of the product.

PEACHES

The evaporation of peaches offers very little to the district which is facing overproduction, since the evaporator cannot offer prices for the better grades which compare with those obtainable in the open market or from the cannery. The cling varieties which are most desired by the cannery cannot be used at all; use can be made only of the firmer-fleshed freestone varieties. The yield of dry product is low, ranging from 225 to 250 pounds per ton, and the market price has been forced below that of apples by the strong com-

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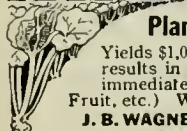
petition of the California sun-dried product. The evaporator may use peaches to lengthen his working season, but could not do so at a price in excess of \$8.00 per ton. This practically eliminates the drying of peaches from consideration except in years of maximum overproduction and complete disorganization of the market or in districts which are out of reach of the canneries.

LOGANBERRIES

The prices which the grower may expect to obtain for loganberries are of course determined by the yield of dry product and the cost of drying, and I shall therefore analyze these items. From 2,000 pounds of fresh loganberries the evaporating plant will make approximately 360 pounds of dry fruit, or one pound from each 5½ pounds of berries. At the beginning of the season or in years of excessive rainfall the yield will fall somewhat below this figure, while toward the close of the season or in years of drought it will rise somewhat above it, but 360 pounds is probably a very accurate average for a plant operating through the season. It may be worth while to call attention to the fact that the first berries which ripen, and which consequently bring the highest prices in the fresh-fruit market, are least valuable for evaporating purposes by reason of their high water content, while those ripening later in the season when the fresh-fruit market has usually declined should bear a premium at the evaporator, as they will usually yield 10 to 15 per cent more dry stock than the earlier portion of the crop.

The actual cost of fuel and labor, including packing, per ton of dry loganberries will of course vary considerably with the type and capacity of the plant, but will approximate \$35.00 per ton, or 1¼ cents per pound of dry product, with not more than 10 per cent variation either way. That portion of the cost of the work which is made up of the items of interest on cost of building, insurance, depreciation of building and equipment, and superintendence of the work will of course vary quite widely accordingly as the plant may be one which operates only upon berries and prunes and for a season of 60 to 70 days or one which has a sufficient variety of fruits to be kept busy for twice that time, but \$15.00 per ton, or three-quarters cent per dry pound, is a fairly close estimate of the cost of those items. This gives a total manufacturing cost of \$50.00 per ton, or 2½ cents per dry pound, for loganberries packed in 50-pound boxes ready for shipment. In some of the larger establishments with a long working season, this cost is reduced to 2 or 2¼ cents, while in some of the smaller

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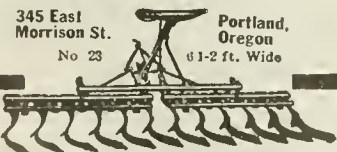
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plants or those under inefficient management it rises above the figure given, but \$50.00 per ton is probably a fair general approximation for the plants now doing business.

If we assume that evaporated loganberries have an average price on board cars at the plant of 20 cents per pound, which is as high a figure as one can take in view of the market conditions of the past three or four years, the maker realizes \$400 per ton. Deducting a manufacturing cost of \$50.00 per ton, there remains \$350 from which to take profits, provide for storage of stock over a period of depression in the market, should such a period of depression occur, and pay the grower for 11,000 pounds of fresh fruit. If we allow 10 per cent of the selling price as profits and storage costs, which would be entirely too small were it not that we have allowed the operator a salary as superintendent of the plant, we have left \$310 as the price of 11,000 pounds of fresh berries, or 2 $\frac{1}{10}$ cents per pound. We may therefore consider 3 cents per pound as an extreme upper limit above which the price to the grower cannot go without wiping out profits so long as the price of the dry stock remains at 20 cents. If the evaporator be a progressive and wide-awake business man, he will pack a considerable portion or all of his product in the smaller package, the sealed paper carton, and will consequently obtain a larger portion of the 35 cents per pound for which such packages are usually sold to the consumer. In such a case, he can pay 3 cents per pound for fresh stock, and can therefore offer the grower as much as is generally realized from berries sold to the canneries.

BLACKBERRIES

The yield of dry fruit in the case of blackberries is approximately 400 pounds per ton. The expense of drying is slightly less than for loganberries, since the fuel used is about 10 per cent less and the time required to complete the drying is correspondingly shorter, but the total cost will range very close to 2 $\frac{1}{4}$ cents per dry pound. It is very doubtful if the evaporator can offer more than 2 cents per pound, which would bring the cost of the dry product, ready for shipment, to 12 $\frac{1}{4}$ cents per pound. Such fruit would come into competition with the sundried California product and also to some extent with a varying volume of sundried wild berries produced in the interior states, and particularly in the Middle South. While the material last mentioned is of extremely inferior quality, it finds a place in the market at prices from eight cents per pound up. For these reasons, practically no evaporation of blackberries has been done thus far in the Northwest, and there seems to be little prospect of such an expansion of the market as will permit the dryers to compete with the canneries for the fresh fruit.

RASPBERRIES

Of the red varieties, the Cuthbert is the only one which is at all in demand for drying purposes, as the market for

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H. M. GILBERT, President and Manager

Growers and Shippers of

Yakima Valley Fruits and Produce

SPECIALTIES:

Apples, Peaches, Pears and Cantaloupes

TOPPENISH, WASHINGTON

dry red raspberries is always sluggish. Since the Cuthbert is the firmest of the red types, it does not mat down upon the trays as do the others, nor does it lose sugar through dripping as most red berries do. Consequently, it makes a more inviting product, but is usually sold at a price 1 and 1½ cents per pound below the black varieties. Of the purple cane berries, the Shaffer is the only one which the Eastern evaporators will accept, and it is taken at low prices for the reason that the yield is smaller than for the black varieties while the product, like that of the red berries, must go into the export rather than into the domestic market. Of the black varieties, the Ohio and the Gregg are most desirable to the evaporator. Both are rather firm berries, hence dry readily without breaking down and malting together, and consequently do not require the rehandling which is necessary with berries of the softer types. The yield of dry stock per ton of fresh fruit will average, for Ohio and Gregg, 450 to 475 pounds, for Cuthbert about 420 and for Shaffer not more than 400 pounds. The prices for the dry product are determined primarily by the production in the Eastern berry-growing districts and particularly in that portion of New York bordering upon Lake Ontario, where it is the custom to dry a portion of the crop in years of large yields but to sell practically the whole crop to the canneries and in the fresh-fruit market in years having smaller production. From such figures as I have been able to collect, the evaporator may be expected to realize about 15 or 16 cents per pound for berries packed in 50-pound boxes, 19 or 20 cents for those packed in 1-pound paper cartons. Since the drying costs will be 2 cents per dry pound, the operator will have 13 to 18 cents from which to get his profits, provide a sinking fund to tide him over seasons of low prices, and pay the grower for 4½ pounds of fresh berries. Consequently 3 cents per pound is an upper limit beyond which prices to the grower cannot go, except in the case of the exceptional plant which puts practically all its product into small packages ready for the consumer.

While the price just mentioned puts the drying of berries out of the question in districts which can secure prices of 4½ to 5½ cents per pound from the canneries, it should be said

Cherry Trees

Fruit and Ornamental Trees, Shrubs, Vines, etc. Free Catalog. Agents Wanted. Special Terms.

MILTON NURSERY COMPANY
MILTON, OREGON

Nice Bright Western Pine FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH.

UNCLE JOHN SEES THE LIGHT.

WHAT DID I TELL YOU, UNCLE JOHN?
GOOD GOODS, HEY, WHAT?

GOLDING IF IT AINT!
YOU DON'T HAVE TER
GRIND ON IT.
I'M FER IT ALL RIGHT.

AND THE SIZE CHEW
ISNT HALF AS BIG
AS YOUR OLD ONE. IT
TASTES BETTER, TOO,
AND WILL LAST LONGER.



THE young fellows teach the old ones and the old ones teach the young—that's the way it is with W-B CUT chewing right along. Less chewing for feeble jaws, less chewing for husky jaws—but the big point is *satisfaction*. Never before has there been so much satisfaction in so little a chew. It's rich tobacco, W-B CUT is. It makes you feel sorry for the fellows who chew so much of the old kind for so little benefit.

Made by WEYMAN-BRUTON COMPANY, 50 Union Square, New York City



**Make It Easier
For Them**

SPARE the horses. Mica Axle Grease makes easier pulling. It gives a smoother bearing than ordinary grease, because it contains powdered mica—blended with the grease by a special process. The mica keeps the spindle smooth, resists wear and pressure, and makes the grease last twice as long. Get a can from your dealer today.

Standard Oil Company
(California)

MICA AXLE GREASE

OUR MONEY MAKING BERRIES

Reduce Your Living Expenses; Easy to Grow; Very Productive. Promote Good Health, Happiness and Prosperity. Have Been Thoroughly Tested in Every State and succeeded where others failed.

AMBROSIA—The best and earliest Blackberry; large, sweet and very delicious.
KING OF CLIFFS—Best of all black Raspberries; bears all summer and fall.
EVERBEARING TREE—Largest of all everbearing red Raspberries; productive.
STANDPAT—Largest and most productive of all the everbearing Strawberries.
MARVELOUS and CACO—Largest, sweetest of all Grapes; enormously productive.
OREGON CHAMPION and CARRIE—Best of all large varieties of Gooseberries.
PERFECTION and DIPLOMA—Best of all red Currants; sure croppers and reliable.

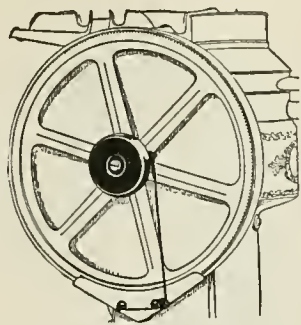
OUR SPECIAL 10 DAY OFFER

We will mail one large plant each of the 10 vines for \$1.00. Regular price \$1.50.

Our Catalogue is Free; send for your copy today. Tells all about them and all other standard varieties, with prices that are very attractive. The Catalogue also describes the "PONDEROSA PEACH," the great yellow free-stone peach. All standard varieties of Apples, Plums, Cherries, Pears, hardy Nut trees, Shrubs, Roses, Garden Roots, and everything for the fruit grower.

Large, well rooted trees and plants give satisfaction and quick results.

ILLINOIS SEED AND NURSERY CO., 104 Main St., Makanda, Illinois



This "Warning Signal"

Insures proper speed on every NEW De Laval Cream Separator.

NINE people out of ten turn the separator handle too slowly.

Thousands of tests with experienced separator operators show this to be the case.

Other tests made by the highest authorities have shown conclusively that there is a big cream loss when the cream separator is not turned fast enough.

You will avoid such a possible cream loss if you buy the New De Laval. The Bell Speed Indicator on the New De Laval is a "warning signal" that insures proper speed at all times. No matter who runs your De Laval, this "warning signal" will tell you when the speed is not right. You hear it and do not need to see it. This one feature alone may easily save you the cost of a cream separator in the next few months.

But that is only one of the big advantages of the New De Laval. Other advantages are greater capacity, closer skimming and easier turning, simpler bowl construction and easier washing.

Why not see the nearest De Laval agent at once? If you do not know him, write to the nearest office for any desired information.

De Laval Dairy Supply Co.

LARGEST DAIRY SUPPLY HOUSE
ON THE PACIFIC COAST

We specialize in Alpha Gasoline and Distillate Engines, Ideal Green Feed Silos, Irrigation Equipment, Centrifugal and Deep Well Pumps and Alpha Spraying Outfits.

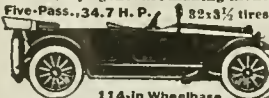
Send for special catalog.

101 Drumm Street, San Francisco

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THE WORLD OVER.

Bush Car Delivered Free

Ride in a Bush Car. Pay for it out of your commissions on sales, my agents are making money. Shipments are prompt. Bush Cars guaranteed or money back. Write at once for my 48-page catalog and all particulars. Address: J. H. Bush, Pres. Dept. 35N



114-In Wheelbase
Delco Ignition-Elect. Stg. & Ltg.
BUSH MOTOR COMPANY, Bush Temple, Chicago, Illinois

Everbearing Strawberry Plants

Superb Variety. Will bear from June to November, of large, sweet, red berries, very solid and productive.

Send for descriptive circulars.

W. B. SIMS, Newberg, Oregon

that the cost of harvesting can be very materially reduced when berries are destined for the evaporator. Instead of being picked by hand, they may be allowed to become fully ripe and then harvested by the use of the "bat and tray." This device consists of a canvas tray or bag supported by a rectangular wooden frame, which is pushed beneath the bush at one side by the operator, who then draws the clump of canes toward it with a wire hook and "bats" the berries into the tray with a paddle made of wire and covered with canvas, which in size and appearance strongly suggests that it is a hybrid between a fly swatter and a tennis racquet. By the use of this device, the berries are gathered by going over the patch not more than three times, while one operator will do as much work as three or four following the ordinary methods. While a good deal of litter is present in berries gathered in this way, the larger portion of it can be easily removed as the berries are spread on the trays, and the remainder is gotten out by passing the dried berries through a fanning mill or over a vibrating screen.

PRUNES

While the drying of prunes may be considered as peculiarly an industry of the Northwest, it would seem that few people not actually operating dryers have any very accurate ideas as to the cost of the work or the returns which the grower who disposes of his fruit to the evaporator should have. Hence a word in regard to the cost of the process and the returns to the dryer may not be out of place. The yield of dry product from prunes is very much larger than that from any other fruit handled, averaging slightly more than 600 pounds per ton, although yields of 700 pounds of thoroughly cured product have been obtained. The time required for drying varies within wide limits, but 36 hours is probably a fair average. Consequently the consumption of fuel per ton of product is 15 to 25 per cent greater than is the case with apples. The labor cost is usually little more than one-half that for berries, since a much smaller amount of fresh fruit must be handled and it can be spread upon the trays much more rapidly. For these reasons the cost of drying, as indicated by the investigations of Brown and Bradford in Oregon and my own in Washington, averages about one cent per pound, exclusive of interest charges, depreciation and oversight of the work, which may add \$2.00 to 5.00 per ton, accordingly as the plant is a large one drying other fruits in season or a small one working only with prunes. With a price of 5 cents per pound to the manufacturer and a drying and packing cost of 1½ cents per pound, there remains \$70.00 from which the operator takes his profit and pays the grower for 6,500 to 7,000 pounds of fruit. Consequently a price of \$17.00 a ton to the grower would be equitable in view of existing market conditions, as a basis for a term contract between grower and manufacturer.

GREATLY IMPROVED HORSE COLLAR PADS

Look Where
the
Arrows
Point!



Patented
in U. S.
Dec. 1
1914.
Patented in Canada
April 6, 1915.

Our new staple and felt reinforcing device gives the hooks a larger, firmer hold on the pad and keeps them from coming off easily. It adds to life of the pad and satisfaction of the user. This form of attachment is

Found Only On Pads Made By Us

Ask your dealer for free Tapatco booklet. Shows pads in colors and contains valuable horse remedies. If he hasn't it, request him to write us direct.

The American Pad & Textile Co.

Canadian Branch:
Chatham, Ontario

Greenfield, O.

The First National Bank

HOOD RIVER, OREGON

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E. O. BLANCHARD - Cashier

Capital and Surplus \$125,000
Assets Over \$500,000

Member Federal Reserve System


I have tried to state the possibilities and to emphasize the limitations of the evaporator as a means of handling fruits for which there is no favorable market in the fresh condition with equal clearness, because it is fully as important that the grower see the limitations as that he realize the possibilities of the method. In order to make some definite statements as to what the grower may expect to realize from such fruit as can be disposed of in this manner, I have attempted an undertaking of the greatest difficulty, namely, the statement of the manufacturing costs for the handling of the various fruits discussed. Such statements can be only approximations, since every element of cost involved—fuel, labor, overhead charges and depreciation—is subject to wide variations not only in the different portions of the Northwestern territory but also within relatively small areas. Nevertheless I believe that the figures given fairly represent the present costs in such plants as we already have in operation. In order to say what the grower may expect to receive, it is also necessary to fix definite prices which the manufacturer may expect to receive for his product for some considerable time to come. Here one must venture upon prophesy, but I have made my prophetic prices conservative in that I have not assumed that dried fruits will share in the present general upward trend of all foodstuffs, or that the present abnormal demand from the nations at war will continue after the cessation of hostilities. That I am well within reasonable limits will, I think, be shown by presentation of the data as to exports and value of dried fruits for the past four years, as shown by the reports of the Bureau of Foreign and Domestic Commerce of the United States:

EXPORTS.

Apples	Pounds	Value per pound
1913	38,734,465	7.02 cents
1914	31,027,551	7.86 "
1915	33,905,608	7.87 "
1916 (to Sept. 1)	9,692,822	7.88 "
Prunes		
1913	94,344,157	5.84 "
1914	35,228,737	7.34 "
1915	50,775,637	7.08 "
1916 (to Sept. 1)	29,694,290	7.36 "
Apricots		
1913	21,325,528	10.82 "
1914	16,541,222	9.66 "
1915	25,747,600	9.02 "
1916 (to Sept. 1)	29,694,290	7.36 "
Peaches		
1913	5,152,147	6.62 "
1914	7,387,161	6.21 "
1915	18,720,272	5.98 "
1916 (to Sept. 1)	6,264,870	6.46 "

These official figures certainly indicate clearly that despite the temporary disorganization of the foreign market occurring in 1914, the general level of values of these products has been well maintained, and there is every reason for confidently expecting that such maintenance will continue for a considerable period yet to come.

The illustration on the cover page of February edition should stimulate every fruitgrower to plant a vegetable garden, because there is nothing that contributes more to good living than a generous supply of fresh vegetables during the summer. The fruitgrower who has



Two minutes saves each tree

Use Tree Tanglefoot

on Shade and Orchard Trees against Canker Worms, Climbing Cut Worms, Woolly Aphides, Ants, and Tussock Gypsy and Brown-tail Caterpillars. It is equally effective against any crawling insects.

Band Trees About Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky 3 months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will water-proof the crotch of a tree or a cavity or wound in a tree, when nothing else will do it.

Sold by All First-Class Seedsmen

1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50 and 25-lb. wooden pails \$6.75. Write today for illustrated booklet on Leaf-eating Insects. Mailed free.

THE O. & W. THUM COMPANY

143 Straight Ave., Grand Rapids, Mich.

Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot

Anthony Fence

Under stress of action each wire within a considerable radius is brought into play, affording, to an extraordinary degree, the resistance of a flexible wall of steel—due to the perfectly balanced woven fabric, in which each wire is drawn under equal tension with machinery of special design. Thoroughly galvanized.

American Steel Fence Posts last a lifetime. Hold fence secure against all conditions.

Sent Free—Our Book, "How to Build a Fence." Dealers Everywhere

AMERICAN STEEL & WIRE COMPANY

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Awarded Grand Prize at Panama Pacific International Exposition
The Supreme Award of Merit

DITCHES!



Make the NEW and Clean the OLD with the MARTIN Ditcher, Dyker and Grader. Makes or cleans irrigation or drain ditches up to 4 feet deep—any width. Makes two to three foot dyke or levee; grades roads. Works in sand, rocks, gumbo or clay—wet or dry—on side hills or level ground.

Reversible, Adjustable, No Wheels, Cogs or levers. Nobreakable parts. All steel. 2, 4 and 6 horse sizes. Guaranteed to do more work than 50 men with shovels. Cost low, upkeep nothing. Over 10,000 satisfied customers everywhere. Write TODAY for catalog, full particulars and introductory offer on new 1917 models.

10 DAYS TRIAL

OWENSBORO DITCHER & GRADER CO., Inc.
560 Evans Block DENVER, COLORADO

THE MARTIN WAY
ONE OF A THOUSAND
"Never was a great friend of the shovel, and since I have used the MARTIN, the shovel and I have entirely dissolved partnership." F. H. LYTLE, Pioche, Nevada.

1842 The Seventy-Fifth Anniversary of 1917



LIGHT DRAFT PLOWS

Built for the Field Test.

Three-Quarters of a Century of "Knowing How" Hammered Into Every One of Them.

The product of the Parlin & Orendorff Co. has always been noted for simplicity of construction, great strength and ease of operation. It was upon such a basis that the founders of this business made their implements, established their reputation, and built their factory. It is upon the same foundation that the business has been carried on to this day, and in 1917 we celebrate our Diamond Jubilee; 75 years of practical experience gained through constantly striving to provide for the exacting requirements of three generations of American farmers.

For an even three-quarters of a century we have met the demand, and today we operate the largest and oldest permanently established plow factory, in the whole world. "It's the way we build them."



Light Draft Plows, Harrows, Planters and Cultivators are made in all types and sizes, to meet the conditions in all sections, and are Backed by an Unqualified Guarantee.

We also make the most complete line of Traction Engine Plows produced, and we have a special catalog devoted to these famous plows.

The P&O Little Genius Engine Gang Plow

was the most popular plow shown at all points on the 1916 National Tractor Demonstration.

We will send P & O Catalogs to any address. While P & O Implements are sold only through established implement dealers, we welcome correspondence from farmers in all sections.

Ask Your Dealer or Write Us,

Parlin & Orendorff Company
Canton, Illinois

Kansas City Dallas Minneapolis
Omaha Portland (Ore.) St. Louis
Sioux Falls Spokane Denver Oklahoma City
Utah Implement-Vehicle Co., Salt Lake City
Baker & Hamilton, San Francisco
Dixon & Griswold, Los Angeles



YOU CAN EARN \$50.00 PER DAY
WITH THE
Gearless Improved Standard Well Drilling Machine

Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2½ gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.

REIERSON MACHINERY CO., Mfgs., 1295-97 Hood St., Portland, Ore.

SPRAY RIGHT

and save time,
money and
fruit



There's a Deming Sprayer exactly fitted to your needs, whether you own a small farm or a large orchard. The new 40-page 1917

DEMING

Catalog shows over 25 improved types and sizes of bucket, knapsack, cart, barrel and power outfits. Your copy free—write.

THE DEMING COMPANY
284 Depot St., Salem, Ohio
Over 1000 hand and power pumps for all uses

an energetic wife, with the use of a steam-pressure canning outfit, can put up enough vegetables during the summer to save buying any during the winter, which also adds much to the living during the winter months. In addition to this, with a good steam-pressure canning outfit, the fruitgrower can put up all his own fruits. There is nothing finer than canned fruits during winter and nothing more wholesome for dessert. The home of the editor is supplied with fresh vegetables during the entire summer and an ample supply of vegetables are canned with a steam-pressure canning outfit for winter use, along with a large quantity of fruits of different varieties. This contributes much to the goodness of the editor's table and in addition is a big saving in expense, both during the summer and winter. Every fruitgrower and farmer should prepare the ground early, planting the early vegetables early, and should they be nipped by frost a replanting can be made. Too frequently in the past fruitgrowers to a great extent have made just one planting, planting the early and late varieties. The modern method is a decided improvement, which is to make a planting every three weeks during the spring and early summer, which enables the family to have a better supply of better quality vegetables than with the one planting of early, medium and late varieties. The vegetable garden is a diversity line for the fruitgrower who has a small acreage and is a source of good income. Good profits are made by truck gardening. The editor calls to mind the experience of a neighbor whose wife looked after the entire vegetable garden, paying the husband for what work he did, supplying their own table during the entire summer, in addition paid the grocery bill during the entire year and purchased a piano besides.

Improvement of Public Grounds

There is nothing that adds more to the attractiveness of the small country town or city than attractive grounds around the public buildings. This remark is also true in reference to the grounds around the depots. In Hood River there is a small but very attractive lawn around the O.-W. R. & N. depot and one around the court house. In California, nearly every depot along the line of the Southern Pacific is surrounded by a beautiful lawn, very attractively arranged with flowers and shrubbery. In Oregon advancement is being made along this line. Arrangements have been made for the improvement of the grounds around the postoffice building at Bend, The Dalles and Eugene. We understand the contract for this improvement was awarded to the Oregon Nursery Company of Orenco; the plans and specifications are being prepared by Mr. H. E. Burdette, L. A., of Portland. "Better Fruit" hopes in the near future to see all of the public buildings, schools and depots throughout the Northwest made attractive with beautiful lawns, arranged with shrubbery and flowers.

Prune Your Trees with GIANT PRUNERS

Cuts every size and kind of limb up to 3 inches thick, with 1 operation

Makes a Clean Cut
Does not Tear Bark
Close to the Trunk
Leaves No Stub



SIMPLE
STRONG
Easy to Use

PRICES

- 1 inch - \$4.00
- 2 inch - 5.00
- 3 inch - 7.50

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GOOD SEEDS

Ten of the Finest Vegetables

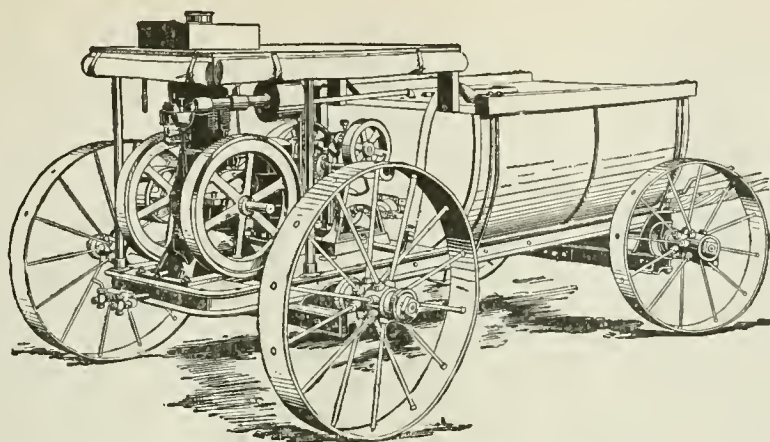
For 25c We will mail one large packet each of the following Vegetables in a coupon envelope. This coupon will be good for 25c worth of seeds selected from our Catalogue on any other order for 75c worth of seeds.

Bradley's Earliest Radish; crisp and brittle.
Bradley's Early Egyptian Turnip Beet; blood red.
Bradley's Earliest of All Lettuce; very crisp.
Bradley's Imp. Early Jersey Wakefield Cabbage.
Bradley's Earliest of All Blood Red Tomato.
Bradley's Best Extra Early Sweet Corn; delicious.
Bradley's Perfection Long White Spine Cucumber.
Bradley's Mammoth Yellow Prize-maker Onion.
N. Y. Improved Spineless Egg Plant.
Improved Mammoth Ruby King Sweet Pepper.

25c buys all the above and in addition we will send one large packet "SPENCER SWEET PEAS," a mixture of 10 varieties; regular price 15c.

Big Illustrated Catalogue FREE.

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104 Main St., Makanda, Illinois




The Hardie Hillside Triplex

Combines in one smoothly running powerful machine all that the most exacting fruit raiser demands in adaptability to any orchard condition—pressure, pump capacity and economy of operation.

The special all steel underslung truck goes anywhere. Side hills and bad soil conditions are conquered. Its rocking bolster and low center of gravity keeping an even load on rough ground. Closely set orchards are thoroughly and quickly sprayed without usual damage to fruit or trees. Its powerful well balanced engine, built with the same skillful accurate workmanship as an automobile, provides an ever ready source of power, one which is always on the job, willing and sturdy, yet so well designed and constructed that its fuel consumption is the lowest.

The Hardie Triplex pump, with its frictionless plungers and threadless valves, makes speedy high pressure work easy, yet so simply designed and constructed that anyone can run it with a certainty of good success. Equipped with a pressure regulator holding the pressure right to the dot which acts like lightning when the nozzles are turned off or on. When the nozzles are turned off it securely locks the pressure in the air chamber while at the same time all the load is taken off of the pump and engine.

 Viewed from every angle of reliability, ease of manipulation, long life and clean cut economical spraying the Hardie Hillside Triplex has no equal.

Equipment such as this, time-proven, certain and sure, without any of the uncertainty of experiment on your part, puts your spraying on a sound substantial basis.

THE HARDIE MFG. CO.

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APPLES
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BETTER FRUIT

VOLUME XI

APRIL, 1917

NUMBER 10

Special Features

Maintaining the Vigor of Trees.

By-Product Discussion
by Growers at the Spokane
Conference.

Information Showing
Excessive Fungus in the Tops
of Trees.

Timely Hints on Home
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Mitchell Junior—a 40-h. p. Six
120-inch Wheelbase

Mitchell
SIXES

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7-Passenger—48-Horsepower
127-inch Wheelbase

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We urge you to see how John W. Bate thinks a great car should be built.

Mr. Bate, the great efficiency expert, has spent 14 years on the Mitchell. This model factory—covering 45 acres—was built and equipped by him.

He has aimed to build this single type at the lowest factory cost. His methods will save us on this year's output at least \$4,000,000. And he puts that saving into extras, to give you a better car.

The Extras

The latest Mitchells have
31 extra features—
24 per cent added luxury—
100 per cent over-strength.

The 31 extras are features which most cars omit. Things like a power tire pump, ball-bearing steering gear, dashboard engine primer, etc.

The added luxury is paid for by savings in our new body plant. We have added 24 per cent this

year to finish, upholstery and trimmings, to make this the beauty car.

The vast over-strength means a lifetime car. In the past three years we have doubled our margins of safety.

Over 440 parts are built of toughened steel. All safety parts are oversize. Parts which get a major strain are built of Chrome-Vanadium.

Several Mitchells have already run over 200,000 miles—over 40 years of ordinary service. In the past two years, not a single Bate spring has broken.

TWO SIZES

Mitchell —a roomy, 7-passenger Six,
with 127-inch wheelbase
and a highly-developed 48-horsepower
motor.

Price \$1460 f. o. b. Racine

Mitchell Junior a 5-passenger
Six on similar
lines with 120-inch wheelbase and a 40-horse-
power motor—1 1/4-inch smaller bore.

Price \$1150 f. o. b. Racine

Also six styles of enclosed and convertible
bodies. Also new Club Roadster.

None Like Them

You will find no other car like Mitchells. Most of our extras are found in Mitchells only. John W. Bate's methods are used in this factory alone. Our body designs are exclusive.

Go see what these things mean to you. See the extra features, extra beauty, extra strength. See if you want a fine car without them. If you do not know the nearest Mitchell dealer, ask us for his name.

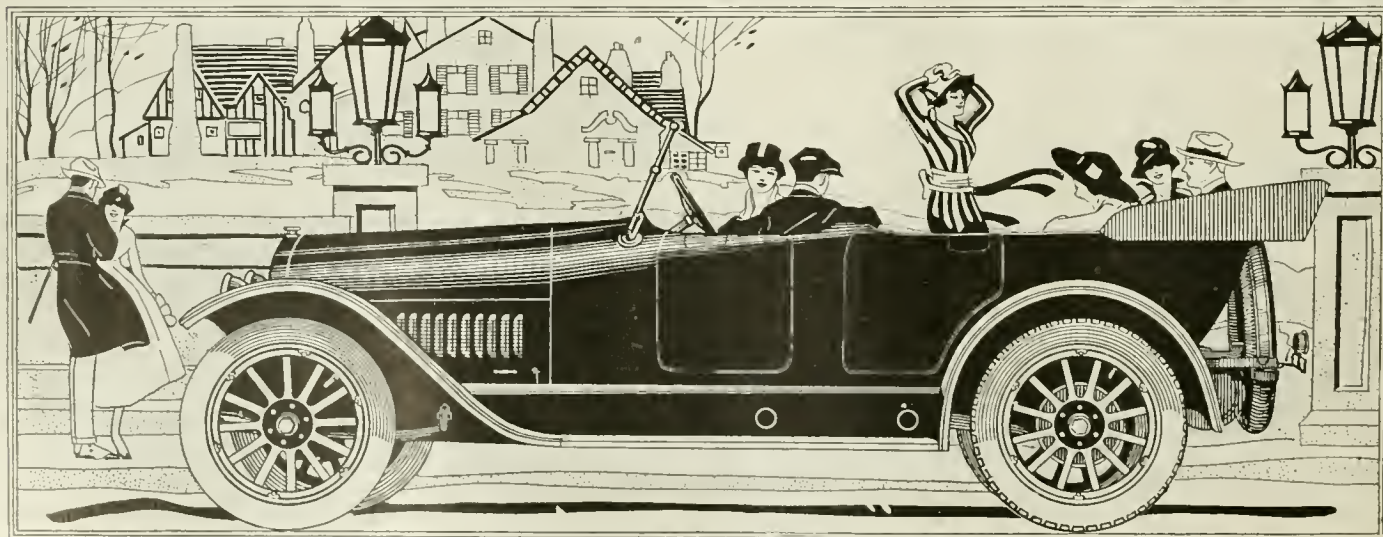
The \$1150 Model

Mitchell Junior is almost like the Mitchell, but a little smaller. But even this size is roomy and powerful. The wheelbase is 120 inches.

See which size you want, and which style of body. All are Bate-built cars. And each one offers at least 20 per cent extra value.

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Mitchell, Lewis & Staver Co., 120 So. Lincoln—906 Railway Ave., Spokane, Wash.; E. Morrison & E. First Sts., Portland, Ore.



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BETTER FRUIT

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Relation of Height of Fruit to Apple Scab Infection

By Leroy Childs, Entomologist and Pathologist, Hood River Branch, Experiment Station

IN the past, while checking up scab experiments under investigation, an interesting observation was made relative to the distribution of scab-infected fruit on the trees examined. Early in the summer it was observed that the fruits in the tops of the trees were much more scabby than those nearer the ground. It seemed probable, then, that since this condition existed in carefully sprayed experimental plots the condition would be found to be present in a more pronounced form where especially careful oversight had not been given each application of spray. Several orchards were examined to determine the correctness of this supposition. In nearly every case this variation in the amount of scab relative to distance from the ground was found to be present, and often very conspicuous indeed.

In view of the important bearing of this discovery upon the whole subject of spraying practice, it was decided to undertake a careful investigation of actual conditions existing at harvest time in certain trees that had been (as was thought) well and carefully sprayed according to schedules that had been arranged by the Experiment Station.

At picking time twelve large trees were chosen in one of the orchards in which scab control experiments were being conducted. These trees were sprayed at the proper time, though not under the personal observation of the writer, and as thoroughly as the equipment of the owner permitted. Seven of these trees received four scab applications (Block 1), the 30-day lime-sulphur application being omitted, and five (Block 2) were given five applications of lime-sulphur.

The apples from Block 1 were picked and separated into three divisions (Figure 1), viz., (1) from the ground to a height of ten feet; (2) from ten feet to fifteen feet; and (3) from fifteen feet to the tops of the trees. After the fruit was picked the percentages of scab were determined for each division in each tree. Only two divisions were made in the case of Block 2 (Figure 2), the fruit being separated from the ground to ten feet, and from ten feet to the tops of the trees.

In choosing the trees from which the counts were made it was necessary to select those which were bearing a relatively light crop and which stood erect. In the case of trees heavily loaded it was impossible to accurately segregate the fruits in their respective normal positions, owing to the sagging of the heavily-laden branches.

The average height of the twelve trees chosen was 26 feet. (Figures 1 and 2.) The largest reached a height of 28 feet. The average greatest diameter of these trees was 22 feet, the widest being 24 feet. Fruit was found present to an average height of 21 feet; on one tree apples were taken 24 feet above the ground.

Although considerable variation was found to exist on the different trees studied, the increase in every case from the ground to the top was found to be constant, the difference in degree of infection in each section of each tree being very pronounced. (See Figures 1 and 2.)

From Block 1, which received four applications of lime-sulphur, the following average percentages of scabby fruits occurred in the respective sections; from the ground to ten feet, 6.52 per cent; from ten to fifteen feet, 22.31 per cent; fifteen feet to the top, 45.72 per cent. The following ratio was observed in the most seriously infected tree: ground to ten feet, 13.72 per cent; ten to fifteen feet, 40.30 per cent; fifteen feet to the top, 60.01 per cent. The fruit in the least infected tree was found to be as follows: ground to ten feet, 2.46 per cent; ten to fifteen feet, 8.23 per cent; fifteen feet to top, 21.47 per cent. The average total scab infection from Block 1 amounted to 22.52 per cent. At first glance an infection of this extent does not appear serious. However, it is so distributed, with nearly 50 per cent of the fruit in the tops of the trees infected, that it cannot be thinned out without heavy losses.

Much less scab was found in Block 2. In this group of trees two divisions only were made in separating the fruit as mentioned previously. (See Figure 2.) A decided variation in the relative amounts of scab according to height was found to occur here, standing out even more distinctly than that in Block 1. An average of but 1.62 per cent infection was found on the fruit between the ground and ten feet, while the infection from ten feet to the tops was 18.08 per cent. The average percentage of scab on these five trees was 12.41 per cent, or nearly half that which occurred on the trees sprayed only four times. The importance of the fifth spray in this case is easily seen.


Unfortunately no segregation of fruit according to height was made from apples on the check trees, so that the natural distribution of scab on unsprayed trees was not determined. However, the total infection present on some of the control trees kept under observation during the past year

amounted to 97 per cent. This very high percentage of scabby fruits indicates that infection must have been general over the entire tree.

It is interesting to compare the result from two other experiments conducted in the orchard in which the observations just discussed were obtained. In these experiments, lime-sulphur was used in the same strength and in the same number of applications; i. e., in one (Block 3) five applications were given; in the other (Block 4) four applications were used. Equipment, rodmen and method of application were identical in all four blocks. Though Blocks 3 and 4 were sprayed earlier in all applications the interval existing between these was about the same throughout the orchard, as the trees were sprayed in their regular turn throughout the season. Two material differences, however, appear to be responsible of the differences in the percentages of scab present. In comparing the average heights of the trees in Blocks 1 and 3, a difference of five and a half feet occurs; in Blocks 2 and 4 but three feet difference in the heights exists. Not only this difference in height occurs but in the case of Blocks 3 and 4 personal inspection of the spraying was given by the writer during each application and parts of the trees missed by the rodmen were pointed out and resprayed. No inspection was given in Blocks 1 and 2; both men working with the spray rig operated rods; in the case of very large trees a man spraying cannot tell the parts of the trees that are not hit with the spray.

The trees in both Blocks 3 and 4 were heavily laden with fruit. On this account the figures given in Figures 3 and 4 are not entirely accurate, as it was impossible to segregate the fruit in all cases owing to the confusion brought on by the severe bending of the higher limbs. An accurate percentage of infection was obtained, however, from fruits which were actually above ten feet at the time of picking. It was found in Block 3 that top infection amounted to 3.86 per cent, while the infection from the ground to the top, which included a good many fruits from the upper division, was .95 per cent. An infection of 62.5 per cent was present on adjoining check trees.

Figure 4 illustrates the results obtained in Block 4, where the "30-day" spray was omitted. The trees in this plot averaged larger than in Block 3, but not as large as those in Blocks 1 and 2. Though many top fruits are included in the figures given in the lower division, the differences occurring in



HEIGHT	TOT. APPLES	TOT. SCAB	% SCAB	TOT. AVE. SCAB
15-25 Tt.	2279 25.13 %	1042	45.72	22.52%
10-15 Tt.	3587 39.56 %	800	22.31	
0-10 Tt.	3201 35.29 %	209	6.52	

FIGURE 1. Summary of results obtained in Block 1. These trees were sprayed four times, the "30-day" spray being omitted



HEIGHT	TOT. APPLES	TOT. SCAB	% SCAB	TOT. AVE. SCAB
10-25 Tt.	2471 66.42 %	442	18.08	12.41%
0-10 Tt.	1249 33.57 %	20	1.6	

FIGURE 2. Summary of results obtained in Block 2. These trees were sprayed five times

the two sections are very distinct. An infection of 12.58 per cent occurred in the tops of the trees in this block, while the lower fruits possessed 4.03 per cent scab. Total average infection in this block was 7.42; where five sprays were used (Block 3) it was 1.57 per cent. The possibilities of using the four-spray schedule will be briefly discussed later in the article.

Relation of Fruit Production to Scab Infection

In connection with the percentages determined in Block A, it is interesting to take into consideration the significance of the relative bearing areas of the trees as shown in Figure 1, and their relation to scab infection as found in different parts of the trees. The average production of fruit in these areas does not vary greatly. This distribution was as follows: Ground to ten feet, 35.29 per cent; from ten to fifteen feet, 39.56 per cent; from fifteen feet to the tops of the trees, 25.13 per cent. As would be expected, owing to the fact that trees of this size reach their greatest diameter between ten and fifteen feet, a larger amount of fruit would be found in this section of the tree than elsewhere. The quality

of the fruit produced in this section is average of the entire tree. As a rule, however, the larger, physically finer, and more highly-colored apples are produced well toward the tops of the trees, while the lower fruits are usually smaller and subject to more injuries, especially those caused by the brown aphid. In referring to the location of the scab on the trees, it is found that 35.29 per cent of the poorer quality fruit is subjected to a scab infection of but 6.5 per cent, while 25.13 per cent of fine quality fruit in the upper portions of the trees suffers an average loss of 45.72 per cent, due to the attack of scab alone. In the case of the former, ordinary thinning will remove all of the scab with no loss; in the upper part of the trees, with nearly half of the fruit infected, the disfigured apples cannot be eliminated without a heavy loss. That the variations which have been discussed are not local or confined to the particular orchard from which these notes were taken was brought out while checking up some twenty odd scab experiments carried on in several orchards. This variation was found to exist, though not so pronounced in many cases, in every one of them.

Supposed Late Infections Explained

This analysis of the relation of scab infection to the location of fruit on the trees solves a point with reference to reported late summer infection. During the past two seasons many growers have reported to the writer that apple scab was developing rapidly during August. An examination of these reported orchards, however, failed to disclose any pronounced development of new scab. Large heavily-laden trees usually stand upright, holding their fruit throughout the spraying season in about the same location in which bloom occurred, until late July or early August. The fruit on many of the top branches, as shown in the accompanying figures, reaches an average height of twenty-four feet. During late summer and early fall the great weight of fruit on these heavily-laden branches causes them to bend strongly downward. By the middle of August the position of fruit on many branches of the trees is largely reversed; i. e., that fruit which during the spraying season was located in the tops can now be found in many cases at a distance of from four to eight feet from the ground. This bending of the branches in the latter stages is quite rapid. The orchardist, however, in his weekly or fortnightly inspection, fails to note the changes that have taken place or to realize that different apples are being examined than those watched during the early summer. Instead, the grower is alarmed to find, as indicated in Figure 1, an apparent increase in the percentage of scab from perhaps 6.5 per cent (that which he had been watching earlier) to possibly 45.72 per cent, the degree of average top infection found on the trees studied. To the observer unfamiliar with the growth and development of this fungous disease, the phenomenon just described would appear to be that of new development of the disease on the fruit.

Scab Development During Late Summer

Our observations this year indicate that little scab developed on the apples after the first of August. In a large series of experiments apples were kept under observation and examined monthly to determine the relative increase of scab during the season. During late summer few changes in the percentages were noted. On the leaves, however, apple scab was more or less active during most of the past summer. In notes under date of August 30, the following is quoted: "Leaves examined for apple-scab infection indicate that the fungus is still active, as it has been throughout the summer. On trees whose fruit is practically clean there is present much leaf infection, especially on the vigorously growing terminal leaves, which in many cases are literally peppered with olive-green, Mycelium-covered areas. The infection seems to be more conspicuous on trees infested with green aphid, whose leaves have been kept damp with a coating of honeydew."

Cause of Scab Variation With Height

The cause for the very pronounced variation in the degree of infection of fruit from the different locations on the trees can be charged to but one fact—lack of thoroughness in making the applications of the fungicide employed. Theoretically more scab infection should be found in the lower portions of the trees, owing to the proximity, during early spring, to the source of ascospores, and later to summer spore infection when the spores are washed down by rains from infections above. Quite the reverse, however, was found to be true, demonstrating that the fungicides used have been decidedly effective on portions of the trees that have been thoroughly covered. These difficulties can only be corrected by facing the conditions as they arise. In the young orchard, naturally this variation does not exist for the reason that the tops of the trees are just as easily sprayed as the bottoms. With the aging of the apple orchard, the bringing of protection to the higher fruits becomes more problematical as time goes on. The spray outfit which produced highly satisfactory results five years ago must be made adaptable to the growth in height of the trees, or more modern equipment must be installed in its place; for it does not pay to spray unless it can be done thoroughly from top to bottom.

The Successful Type of Spray Nozzle

The type of spray that has been found to give the best results at Hood River in controlling apple scab is applied in the form of a fine mist; double nozzles are usually used, since they enable the operator to apply more material in a given time. To effect complete control of the disease, it has been demonstrated that it is absolutely necessary to cover not only the fruit thoroughly in every application, but also both upper and under surfaces of the foliage—in other words, to prevent literally both fruit and foliage infection. The mist spray, accumulating as it does in fine globules over the surfaces, produces a much thicker, more complete covering than occurs when a drenching or driving spray is used. The latter, breaking and running upon hitting a surface, draws off much of the spray material, leaving, upon drying, an extremely thin film which lacks the lasting and weathering properties of the thicker mist application. The actual application of spray, however, should be made adaptable to different weather conditions. Often it is absolutely necessary to continue spraying in windy weather in order that protection from scab be gained. Under these conditions the mist nozzle should be discarded for a coarser type. This change will enable the rodman more nearly to reach all parts of the trees which would otherwise be impossible. A thin film is much better than none at all.

Incomplete Protection Obtained in Many Orchards and Causes for It

The average orchardist, regardless of the size or age of his trees, sprays

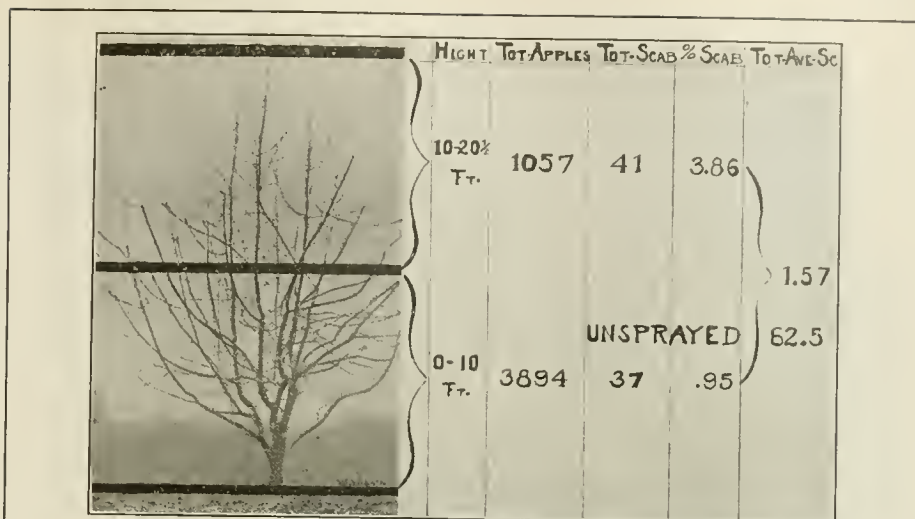


FIGURE 3. Summary of results obtained in Block 3

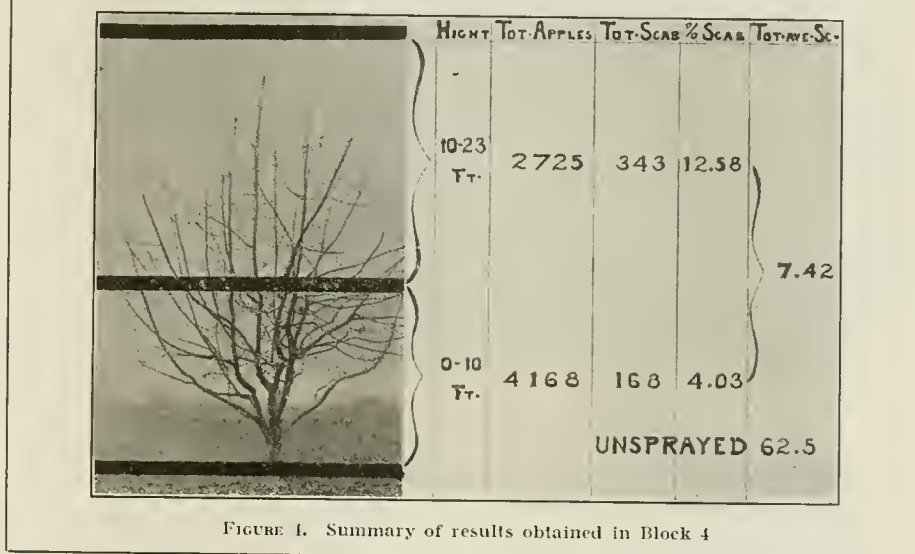


FIGURE 4. Summary of results obtained in Block 4

with two leads of hose and from the ground. Considering that the rods are twelve feet long (many growers use ten-foot rods) the normal position of the nozzles while in use is at a height of about fourteen feet (see Figure 5). The rodman, in working around the tree, raises the nozzle at intervals to a height of seventeen to eighteen feet (see Figure 6). As a long day wears on, the holding of a heavy rod at arm's length becomes very tiresome; for this reason the operator becomes unconsciously careless and the tops are slighted. By referring to the heights of the fifteen-year-old trees it will be seen that on the average eleven feet of tree surface occurs between the end of the spray rod, when raised to its highest point, and the top foliage. Leaves and fruit in this area, then, are dependent entirely upon the pressure exerted by the outfit and the air, to force and carry the liquid to its proper place. Under absolutely quiet atmospheric conditions it is possible to cover fairly well the under surfaces of the higher foliage and the fruit of these large trees, but a good many top surfaces are missed. With the slightest wind blowing the benefits derived from the air as a carrier are largely reduced, and are completely destroyed by the wind

that normally occurs at Hood River during a greater part of the spring. In many instances the writer has observed orchardists spraying in a wind (spraying often has to be done under such conditions) that prevented the reaching of the trees at a greater height than five feet above the end of the rod. The average wind during the spraying season prevents the reaching of the trees at a greater height than six or seven feet above the end of the nozzles, and not very thoroughly at a greater height than four or five feet above. For example, then, considering the tree being sprayed as 28 feet high, the rodman exerting himself to the extent of holding the rod at arm's length does not thoroughly cover anything above twenty-two or twenty-three feet. (Figure 1.) This leaves the fruit and foliage, chiefly foliage, over a surface of five or six feet entirely open to infection. The infection which takes place is most advantageously located to further the spread of the disease over the tree; for with each rain millions of spores are washed down onto the fruit and leaves below, which if not thoroughly protected by a good coating of spray, become readily infected.

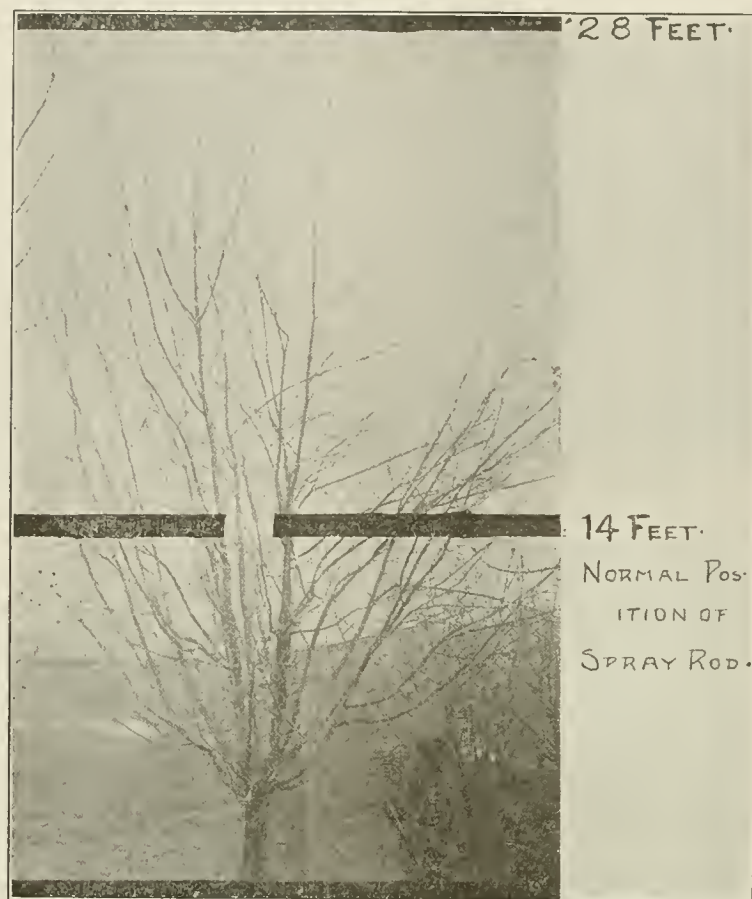


FIGURE 5. This shows relative position of the nozzles to the height of a large tree while spraying in a normal position

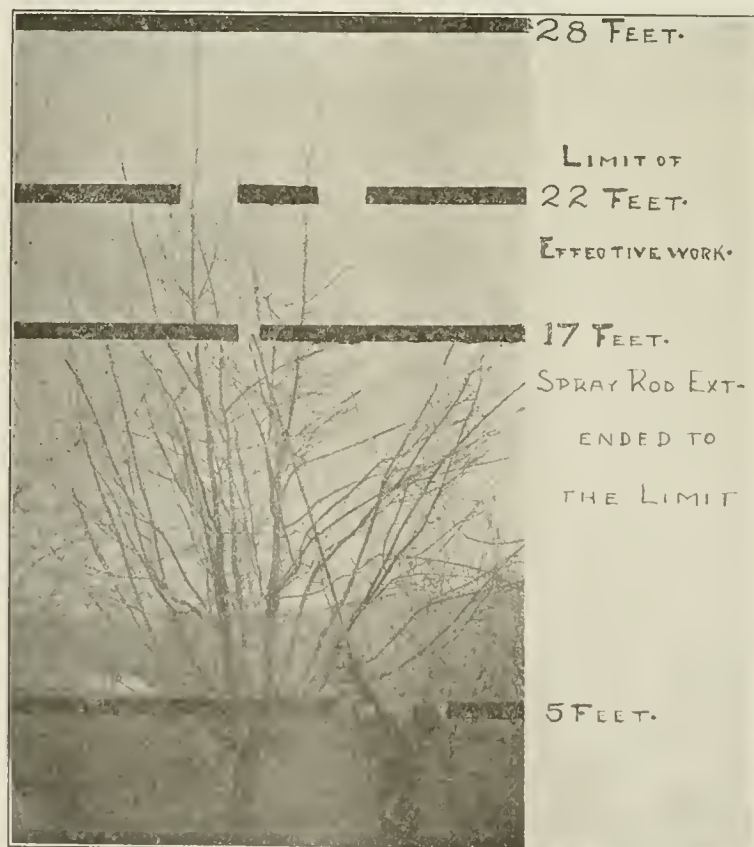


FIGURE 6. This shows the relative position of the nozzles to the height of a large tree when the rod is held at arm's length. Note that there is much tree surface above this point

Is the Fifth Scab Spray Necessary?

The secret of growing scab-free fruit lies in the absolute prevention of leaf infection. If this is accomplished, the apples will incidentally be kept clean. With a portion of the trees left open to infection, even though it be only a few leaves in the top, chances of serious fruit infection, taking place early in the summer, are greatly increased, especially if the 30-day lime-sulphur spray is omitted. The sixteen days of rain which occurred during late June and early July, produced at least 75 per cent of the scab which occurred at Hood River during 1916. Infection could not have taken place if fruit and foliage had been kept clean up to this time. As shown in Block 4, though the results from the standpoint of scab control were not as complete as obtained in Block 3 with five applications, the 7.42 percentage of infection that resulted must be considered a very effective reduction. The trees in this experiment were last sprayed on May 24. On June 17, nearly a month later, rain began falling, continuing some every day until July 3. There is no doubt that a good deal of the protection derived from the last application of spray had disappeared through weathering and expansion of both the fruit and leaves before this favorable scab-infection weather was over. In spite of this long-continued rainy spell, infection of but 7.42 per cent of the fruit resulted. During this time scab increased on the unsprayed check trees from 20.5 per cent to 62.5 per cent. The trees in this plot were known to be practically free from scab at the time the "30-day" spray was applied to the other experiments. The infection of fruit at that time was only .39 per cent, and since it was so clean to begin with, infection failed to develop in serious proportions regardless of the prevailing weather conditions favorable for scab development. There is no doubt that the first four scab sprays scheduled by the Experiment Station are necessary; whether the fifth is required (if we dare draw inferences from one season's work) depends upon the amount of infection present at the time the "30-day" spray should be applied. If the trees are absolutely clean at this time, it appears from the excellent results of the test just described that they need no further applications regardless of the weather conditions. At the present time, however, few orchardists are sufficiently competent to determine whether their fruit and foliage are clean. Clean does not mean that one can find a spot here and there. We have called an infection of .39 per cent fairly clean, and that means the finding of a little more than three scabby apples in each 1,000 examined. Until growers can properly analyze their crop and determine the amount of scab present in actual percentages, it will not be safe to omit the "30-day" spray.

Spray Outfit for Older Orchards

To overcome some of the difficulties that have been discussed, it is necessary for the orchardist to develop and

Continued on page 36

Would you plant your fruit trees in large tubs?

"Without the use of dynamite in tree-planting," says U. S. Bulletin No. 38, "the roots soon meet with the smooth and compacted sides of the hole, through which they have great difficulty in penetrating. The tree is in about the same situation as if it had been planted in a large tub."

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Discussions at Ninth National Apple Show

Following the Address Given by Dr. J. S. Caldwell, "Cost of Operation and Returns from Evaporated Fruits," which appeared in March Edition of "Better Fruit."

Question: What is the best by-product plant to take care of cull apples?

Dr. Caldwell: That brings us back to vinegar plants and evaporators. I should really regret to see any great number of vinegar plants established in the Northwest, because I believe in the long run they cannot be profitable. However prices may be at the present, they fluctuate rather widely, and we are restricted in the area over which we can market such a product on account of bulk and freight rates. The evaporator is inherently more profitable. It will make considerable volume of vinegar from peelings and cores and is more profitable of itself. Canneries cannot handle any very large volume of apples because that market is limited and is not enlarging materially, if at all.

Question: What would be the approximate cost of such a plant?

Dr. Caldwell: That will depend upon the type of building constructed. In a publication which I have on this subject I have recommended three types of evaporators: the old kiln type, which is the least expensive in construction and operation, but in the long run the quality of the output may be slightly inferior; the tunnel type, which is the leading Northwest evaporator and what I have called the all-purpose type. On a basis of eight tons a day, which is about the smallest plant handling apples only, over a season of from 70 to 90 days, I should say a fireproof building, fully equipped with all labor-saving equipment ought to be built ready to run for \$5,800. That includes everything except parer and slicer, which would probably cost \$750 delivered. That includes everything neces-

sary to begin business with in a fireproof building. Without fireproof construction the cost can be practically what one desires to make it if one wants to take the risk of wood or sheet iron construction.

Mr. Jacobs: Where can you see such a plant?

Dr. Caldwell: So far as I can recall there is no strictly fireproof plant in the Northwest.

Mr. McKee: Eliminate fireproofing, could we find a plant in operation along those lines?

Dr. Caldwell: D. A. Snyder, Dayton, Oregon, has one of the type of plants described in the bulletin, where you will find figures and descriptions. Has been in operation almost thirty years in that building or its predecessor.

Question: Over those thirty years, has he been successful in the operation of his plant?

Dr. Caldwell: Yes, he has. He has the Willamette Valley, of course, for his supply of fruit, and he is unique in that he was the first man to evaporate vegetables and he had that market during all the period of the opening up of Alaska. Mr. Snyder's plant is unique also in the entire absence of labor-saving equipment that would be considered indispensable in putting up a plant at the present time. Hand labor replaces all labor-saving equipment in his plant. It would be possible to reconstruct his plant so as to increase its capacity and greatly decrease the labor cost, but he has been successful in spite of that.

Question: Isn't it true that the liquor manufacturers took a considerable portion of the dried smaller fruits in

making certain brands of their products?

Dr. Caldwell: That percentage was about $3\frac{1}{2}$ per cent so far as I can get at the figures. In the aggregate that would cut very little figure. In a normal season the export trade takes something like 68 per cent of the dried apples, 71 per cent on the prunes and so on down the list. Germany has been our greatest purchaser of dried fruits.

Mr. McKee: The prohibition laws would increase the demand for cider?

Dr. Caldwell: Tremendously.

Question: If the Ben Davis apples were put into the dried process what would be the value?

Dr. Caldwell: If one were to use the Ben Davis, orchard run, it should be possible to make 45 to 50 per cent extra fancy stock, which would go on the market in small paper cartons for the better retail trade and bring a considerably higher price. Someone may say there isn't the demand for that material. It is true only $2\frac{1}{4}$ per cent is of that grade now, but there is a consistent and strong market for a larger amount of it, and I have in my desk some eight or nine letters from dealers in six states, three of them Southern, asking whether it is not possible, with the finer fruit which we produce, to get from the evaporators extra fancy fruit which they can sell to the fancy groceries. There is a demand for material of that character.

Question: How do the Gano and Black Ben evaporate?

Dr. Caldwell: In the dark stock group. That is characteristic of the Black Ben; always sells for a lower price than the Ben Davis.

Mr. Dean: In the factories here in the Northwest, canneries, evaporators, etc., does the manager have an interest in the factory or is the capital raised entirely by the community?

Dr. Caldwell: As for the co-operative plants the figures show that something like 83 per cent of them have been entire failures; that something like 10 per cent of the remainder have never yielded a profit worth mentioning, but have been carried by some other activity in which the co-operative organization was engaged. Which leaves only about 10 per cent that are profitable.

Mr. Dean: The reason I ask is that at Missoula the Chamber of Commerce has funds to finance such a plant, but up to date it has been impossible to find a man who would put any capital in and act as the manager.

Dr. Caldwell: I haven't known of any instances in which the failures occurred where the manager was heavily interested in the business, but I haven't looked into that detail. But I have seen a great many salted mines in the way of evaporators. I have seen obsolete plants unloaded by a salesman on a community at prices it would have brought ten years earlier when it was usable. That is the difficulty with the business today; so many communities have suffered in this way. That is the chief difficulty in getting by-product plants under way; so many com-

Continued on page 30

Friction

Is the Problem Solved in

Hudson Super-Six

This is to give you a clear understanding of what the Super-Six motor means.

This is why it holds unquestioned the leading place in Motordom. Why it won all the worth-while records. Why it stopped the trend toward Eights and Twelves. And why it gave supremacy—perhaps forever—to this new type of a Six.

What Friction Does

Motion causes friction. You know this in farm machinery. It is friction that finally destroys it.

In a high-speed motor the vibration makes friction a big problem. A large part of the power is consumed by it. The motor's endurance is limited.

So the chief problem in motor car engineering has been the reduction of friction.

Sixes Disappointed

The Six-type was adopted to lessen this vibration. The Light Six, with small bore, was made to lessen it further. But the highest attainment in a Light Six proved a disappointment. Motor friction was not reduced as engineers had hoped.

So some leading makers, including the Hudson, started tests with Eights and Twelves. It was hoped that twin motors, set at angles, would solve the friction problem.

Then Came This

That was in 1915. Many engineers thought the Six type was doomed. That the V-types would displace it, as they had in certain cars.

But in that year Hudson engineers invented the Super-Six. In December, 1915, we were granted patents on it.

Tests proved that this invention added 80 per cent to the efficiency of the Six. And it did that solely by reducing friction beyond any other type.

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Last year, in a hundred tests, the Super-Six won all the stock-car records which can prove a motor's value. It won the records for speed, for hill-climbing, for quick acceleration and endurance.

It broke the 24-hour endurance record by 32 per cent. It twice broke the transcontinental record in one continuous 7000-mile round trip.

So, in performance and endurance, the Super-Six has no rival. And that is due to the fact that friction is reduced almost to nil.

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This endurance will probably double the life of the Hudson car. The reduction of friction saves immense power waste.

In addition, we this year add to the Hudson a wonderful gasoline saver.

So the Hudson Super-Six means economy to you. It means a daily saving—in the long run, a very big saving.

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Winter Kill in Mild Climates

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis, Oregon

CLIMATIC conditions in Oregon, and especially in that portion of the state west of the Cascade Range, have for the past two years been hard on fruit trees. It has been, so to speak, unusual weather, although I hesitate to use that term, because I am beginning to conclude after eleven years' residence in the state that the only weather we have is unusual. But to trace back our steps for a moment, we will remember that the summer of 1915 was extremely dry. We finished the year with 10 to 20 inches below normal rainfall. Many trees became too dry and suffered, others were overstimulated with irrigation or tillage, because of the very dry condition, which induced some men to practice methods which even under dry conditions tended to overstimulate. This dry summer was followed by a winter of a very freaky nature. We find, for example, that during the entire winter in many sections the ground was unfrozen. It was during a portion of the time saturated with moisture and covered with snow from 1 to 5 feet in depth. At Corvallis, for example, we find that on January 19 the temperature dropped to 8 degrees, and there was hardly a day in the month but what had killing temperatures. By the middle of February there was an abrupt change in the weather. The temperature rose in the day from about 60 to 70 degrees and lowered at night to the vicinity of 30 degrees, which would mean that out in the open orchards freezing temperatures were experienced. In fact there were nine killing frosts during the month. During the latter part of the month the sap was

beginning to rise in many of the trees. The abrupt change in temperature, amounting to 30 degrees in three hours, froze the sap. The next day the temperature again rising to about 60 degrees, caused a very rapid thawing. This alternate rapid thawing and freezing proved disastrous to many trees. Had the ground been frozen, the roots probably would have remained inactive, but I think with no frost in the ground the sap was encouraged to rise. The peculiar weather was followed by one of the heaviest frosts in history in the state during the first two weeks in May. The past summer of 1916 proved unusually wet and the fall extremely dry. This made ideal conditions for early killing frosts, and the first week of October found the temperature as low as 20 to 22 degrees. The dry fall seemingly had an influence in hardening the young fruit trees, but was not sufficient to check English walnuts and the result was extreme damage, especially on the low lands, to English walnuts. We find, however, just a reversal of conditions compared with February. The sap starts to flow late in the walnuts and the February weather did not affect them. On the other hand, with some fruits such as apples and pears, the sap starts to flow early, and the weather did affect them. In the fall most fruit trees mature easily, but the walnut matures extremely slow. Thus the fruit trees had little or no damage and the walnuts, because of active sap conditions, were severely damaged.

We use the term "winter killing" in a rather broad sense. Strictly speaking it is not real winter damage as we

would expect lower minimum temperatures to really give true winter damage. It is more a condition which is identical with sour sap. One of the causes is a fluctuating temperature, the damage being aggravated by unusual environment such as extreme drouth, poor soil drainage or poor air drainage. The evidences of winter killing were variable. With apples there was a discoloration of the bark above the snow line and rapid splitting and loosening of the bark. With pears it was somewhat the same as with the apples, but in most cases the top of the trees was more severely damaged. On the older trees the blossoms fell, or the fruit shed rapidly after setting. The leaves in some trees did not develop to more than one-tenth their normal size. Some trees did not throw out any leaves. Most of the trees had uninjured roots and tended to throw up strong sprouts. The walnuts which were injured in the fall were simply frozen and meant in some cases a damage back to three-year-old wood.

Last spring some varieties seemed to be more affected than others. For example, trees that were worked over to Northern Spy stock did not seem as badly damaged as some varieties on their own stock. In an orchard consisting of Grimes on Northern Spy stock, there was little or no damage. Wagener's were quite severely damaged. Ortleys showed a little or no damage and Yellow Newtowns a small amount of damage, being perhaps more severe in the top of the trees than on the

Continued on page 27

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Green Manuring

Green manuring, often spoken of as cover cropping, should be practiced more. Henry Holtz, of the Washington Experiment Station, states that green manuring prevents washing, adds organic matter to the soil, prevents leaching, and affords winter pasture.

Summer-fallowed fields, corn fields and even stubble fields wash badly in spring, due to heavy rains and frost. This can be largely prevented by a green manure crop. In some sections of Eastern Washington, where the organic matter is getting low, and there

is a rainfall of fifteen inches or more, rye can be sown in the stubble in the fall and plowed under in the spring when the rye is about eight to ten inches high. This material will easily decompose during the following season. In orchards, crops that are well suited for this, especially in the irrigated sections, are vetch, rye, wheat, rape and peas. In the sections of the state west of the Cascade Mountains, where the rainfall is high, a large amount of the plant food material is leached beyond the root zone. This can be prevented by the use of green manures, which

will take up the soluble plant food materials and return them again to the soil when plowed under in the spring.

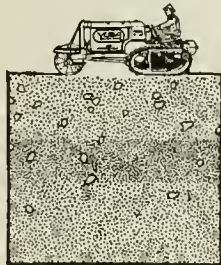
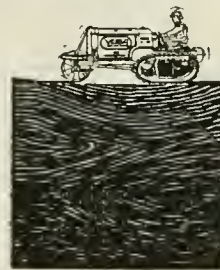
In addition to the beneficial effects upon the soil, green manuring crops make good winter pastures. Much better results can be secured by plowing under two or three tons of barnyard manure per acre with the cover crop. Organic matter must be sustained either by green manuring, crop residues or barnyard manure if the soil fertility is to be maintained.—Bulletin of the State Agricultural Experiment Station, Pullman, Washington.

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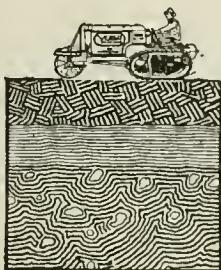
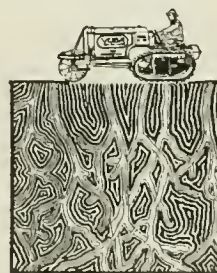
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Sand? Admittedly a hard soil for any tractor. Frankly the upkeep of the tractor will be somewhat greater. But, and this may surprise you, the Yuba Ball Tread wears very little faster under these conditions. The reason? Less bearing surfaces to grind away and better steels to stand the wear.

The Yuba is a favorite for breaking tule land. The high clearance of the Yuba disc plow keeps it from clogging up. The Model 20-35 and plow form a "one man outfit."

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In any soil the Yuba outfit—a Yuba tractor and a Yuba plow—have points of distinct advantage. Write us your conditions and let us tell you something of what you may expect the Yuba to do for you.

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Control of More Serious Insects at Hood River

By Leroy Childs, Entomologist and Plant Pathologist, Hood River Branch Experiment Station

Leaf Roller.—At the present time the distribution of the leaf roller does not include the entire Hood River Valley. The area of chief infestation includes the Pine Grove section, and generally speaking is found in serious numbers within a radius of not more than a mile and a half or two miles from the Van Horn station. The first spray of the season, consisting of an application of a miscible oil, is directed toward the control of this insect. Oils applied at this time have been observed satisfactorily to control the brown aphid. However, at Hood River it is believed at the present time that with the exception of the leaf roller other insects can be more effectively and economically handled by the use of other sprays.

Brown Aphid.—This is the insect that is responsible for the development of "aphid apples"—small, gnarled clusters of apples that are usually found on the fruit spurs in the lower parts of the trees. If the leaf roller is present in the orchard, spray with miscible oil, as recommended for this insect. If the leaf roller is not present, add tobacco at the rate of 1 to 1200 to the delayed-dormant application of lime-sulphur.

Woolly Apple Aphid.—Experimental work carried on for the control of this insect has up to the present time been productive largely of negative results. This has included fall and spring applications of miscible oils. These findings eliminate oils of the heavier type from being of any decided service in controlling this pest. The insect must be combated in the summer. Tobacco added to the thirty-day spray in 1916 was observed to check the development of this insect. It must be remembered, however, that the thirty-day

lime-sulphur spray must be applied with extreme care in order to prevent burning. This means that a thin, even application must be given the trees. To destroy the woolly aphid, a drenching and driving spray has to be employed in order to reach the insect, and for this reason the gaining of one end may defeat the other, and vice versa. Growers who can make these applications separate should do so. In applying the tobacco alone, add 3 or 4 pounds of soap to each 100 gallons of the spray. The woolly aphid at the present time offers more complications relative to its control than any other insect pest present in the Hood River Valley. The infestations as a rule do not become very pronounced until toward the middle of the summer, and some time after the scab sprays have been applied. For this reason, contact insecticides used during the early season have proved of little value in reducing the numbers of this pest. This period of extreme infestation occurs at a time when orchardists are very busy thinning, irrigating, cutting their hay, and doing many other little duties that have been neglected during the long spring siege of spraying. It is very clear, however, that this pest, as far as we know at the present time, can only be handled during the summer time. For this reason it will be necessary to apply at least one extra summer application of tobacco and soap that the pest be kept under control.

Green Aphid.—During the past two seasons the green-apple aphid has been very prevalent in the Hood River Valley, and especially during 1916, at which time more injury was caused by this insect than probably any other

single insect pest or plant disease present. This injury was not only due to the "smutting" of the apple, which prevented the proper coloring of red varieties, but produced an injury on account of their feeding on the fruit themselves. In severe cases this injury resulted in a gnarling which resembled somewhat that caused by the brown aphid. On yellow varieties red spots were produced, which resembled in color those caused by the San Jose scale. It was found that if these spots were produced early in the summer, they largely disappeared before the apples were harvested. No experimental work has been attempted in the control of this insect at Hood River. In 1915 and 1916, however, it was observed that no contact insecticide applied before the first of June was of any pronounced benefit in controlling this pest. If the observations made in these two years are a criterion, it will be necessary to fight this insect in the summer, along with the woolly apple aphid. It was observed during the past year that orchards sprayed with the thirty-day application with tobacco 1-1200 were much freer from the green aphid than adjoining unsprayed orchards.

Codling Moth.—Pears as well as apples should be sprayed if the insect has been found attacking this fruit.

Pear Leaf Blister Mite.—This mite overwinters under the bud scales of the pears. In the spring as soon as the leaves appear, they burrow into the newly-developing tissues, causing the foliage, and in some cases the fruit, to become spotted with puffy red areas. These latter turn black, and the leaves usually drop prematurely. This organism is easily controlled by the use of lime-sulphur 1-10 just as the buds are bursting. Applications made later than this time will do little or no good.

San Jose Scale on Pear.—Owing to the fact that it has not been necessary to use much lime-sulphur in the pear orchards up to the present time some have become infested with San Jose scale. These orchards should be sprayed with lime-sulphur 1-10 just as the buds are bursting.

Attention, Fruit and Vegetable Growers

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Maintaining the Vigor of the Apple Tree

By C. I. Lewis, Chief Division of Horticulture, Oregon Agricultural College

A LARGE percentage of the apples of the Pacific Northwest are grown on light types of soils, such as volcanic ash, silt, and sand loams. In such soils there is a tendency for the organic matter to oxidize rapidly, and they soon become depleted in nitrogen. Orchards from eleven to twenty years of age in full bearing on such soils often show an alarming condition, the foliage becoming yellow and thin, the blossoms small and inconspicuous, the percentage of set very small, the yield light; and an accumulation of physiological troubles appearing, such as little-leaf, apple rosette, die-back, winter-kill, and similar troubles, which are distinctive of devitalized conditions.

Four years ago the Oregon Experiment Station began making tests with such trees. I prefer, in speaking of such orchards, to use the tree rather than the acre as a unit, since the number of trees per acre varies according to the system of planting. Complete experiments have been tried with the following: Nitrogen, 3.4 pounds per tree; superphosphate, 4.54 pounds per tree; sulphate of potash, 3.4 pounds per tree. These were used singly and in combination of two or three.

In other orchards experiments were carried on solely with nitrogen, as the trees indicated nitrogen deficiency. So far the only result obtained from the

complete fertilizers has been secured where nitrogen was used. In the orchards where we have tried all nitrate of soda experiments remarkable results have been secured. The trees were quickly restored to normal condition; the foliage became dark green and thick; the yields often increased tenfold; the pollination, or set of fruit, improved remarkably; the blossoms became highly attractive in color; and the frost damage was much reduced. The color of the fruit was probably not so good as in the checks, but on the whole was of a good commercial grade. An example of the results secured in one such orchard in the past year is shown in the following table:

SPITZENBERG				
Plot:	1	2	3	4
Nitrate of soda, per tree, lbs.	7.30	5.00	None	3.00
Terminal growth, in.	11.70	9.90	4.10	14.10
Leaf growth—				
Length, inches.	2.95	2.92	1.99	2.90
Width, inches.	1.79	1.90	1.35	1.85
Yield per tree, loose boxes	16.10	13.44	8.56	12.61
Increase, per cent ...	87	56	..	47
NEWTOWNS				
Plot:	1	2	3	4
Nitrate of soda, per tree, lbs.	7.30	5.00	None	3.00
Terminal growth, in.	9.50	6.20	4.50	6.40
Leaf growth—				
Length, inches.	2.93	2.79	2.32	2.75
Width, inches.	1.92	1.82	1.48	1.93
Yield per tree, loose boxes	11.10	11.90	5.30	9.50
Increase, per cent ...	166	121	..	79

Here is shown a response in proportion to the amount of nitrogen used. After examining all factors, such as tree, fruit, etc., we believe that five pounds per tree is about the desirable amount.

This nitrogen should be put on broadcast at least a month before the trees bloom so that the nitrogen will become dissolved and be available for the tree. In locations where the soil is excessively dry so that the nitrate may not dissolve, add a pound of nitrate to every gallon of lime and sulphur spray. This strength is for dormant trees. From three to five gallons should give the tree a good stimulus. To get striking results this food must be applied before the blooming period. The great value of the nitrate seems to be that it is assimilated quickly and gives immediate aid. Our experiments, however, lead us to believe that some general conclusions on the use of nitrate, which have been formerly emphasized, are perhaps rather misleading. We believe that under normal conditions, the amount of leaching may be insignificant. We also believe that the nitrate exerts an influence for several years.

It must be remembered that fertilizers never take the place of tillage; that when men complain of the ground becoming hard and packed and deteriorating in physical condition from the use of fertilizers, it generally means that such men are not tilling the soil properly. To get the best results in-

The Reason Why



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has won the confidence of the growers is because of its reliability. Out of the many samples analyzed by the Government and the different states not one has been found to fall below our guarantee.

There are insecticide laws fixing the chemical requirements of arsenate of lead, but no official control is exercised over the physical character of the product.

The physical nature of arsenate of lead, whether it is coarse or fine, soft or lumpy, is of equal importance with the chemical composition.

It is difficult to make a coarse, heavy lead stick to the fruit and foliage, as a good deal runs off with the dripping water; furthermore it does not cover uniformly, but dries in blotches.

Unless the trees are protected by an even covering of poison clean fruit cannot be expected.

LATIMER'S DRY has won its position in the insecticide field because it produces results.

LATIMER'S DRY does not require artificial adhesives to make it stick. Its extreme fineness gives it ideal sticking and covering properties.

Each step in the manufacture of LATIMER'S DRY is under rigid chemical control and we know that every pound that leaves our factory is right physically and chemically.

Do not bargain hunt when you buy your spray.

Cheapness is not the first consideration, but dependability.

Let LATIMER'S DRY convince you this year.

The Latimer Chemical Company

Grand Junction, Colorado

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The Coffman Company, Spokane, Washington.
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Yakima County Horticultural Union, North Yakima, Washington.
The Pacific Fruit & Produce Company, Portland, Oregon.
Richey & Gilbert, Toppenish, Washington.
The Morgan Lumber Company, Zillah, Washington.
The Fruit Growers' Exchange, Hood River, Oregon.
Walther & Williams Hardware Company, The Dalles, Oregon.
The Medford Fruit Company, Medford, Oregon.

tensive tillage should be given the soil. Where irrigation cannot be practiced, sow cover crops. Where irrigation can be practiced, put in a crop of clover or alfalfa.

The question is sometimes asked: "Is it possible to overdo the use of nitrate?" It certainly is possible; too much nitrogen makes too much wood growth, has a tendency to make the fruit overgrown, soft, and poorly colored. It should not be applied to the trees unless they show a need for the same. In this way one will avoid any danger of excess. The frequency of application should depend upon the response in the trees. Whenever they show indications of decline or light yield, add nitrogen.

Reports come occasionally that nitrate is a poison, due to the fact that it allows an accumulation of sodium carbonate in the soil, thus increasing alkalinity. There is a bare possibility that, in soils which are exceedingly alkaline and where very heavy applications of soda are used, this is possible. It must be remembered, however, that if enough nitrogen is added to furnish three hundred pounds of soda per acre and all the carbonate of soda accumulated as free alkali, it would increase the alkalinity of the soil only one ten-thousandth of one per cent. That is a very small amount and we are not certain that the carbonate of soda would increase abnormally, as the soil is very complex and there are many factors to be considered. To those who fear an increase of alkalinity the addition of some acid, such as acid phosphate, would be advisable. From one hundred to three hundred pounds of the phosphate per acre, under such conditions, could be used.

Timely Hints for Home Gardener

U. S. Department Agriculture.

VEGETABLE seed for planting should be ordered at once so as to be on hand as soon as the weather and condition of the soil make planting possible. Before ordering seed the home gardener would do well to look over his garden plot, decide on the best location for each vegetable, and determine how much seed he will require for the space available for each variety.

He will find it helpful to make a rough plan of his garden on a large sheet of wrapping paper. On this plan he can indicate the spaces to be used for each variety and also by means of colored pencils or symbols show where a second crop is to be planted or interplanted between growing rows, and also arrange for the second and third crops which are to follow those previously harvested. Such a plan will enable him to keep the garden busy all season supplying fresh vegetables during the summer and producing in the late fall root and other crops for winter use. Once the heavy preliminary spading and working of the garden has been done, it is about as easy to raise two or three crops as to keep the garden clean of weeds to produce only one picking. The specialists advise those who are not used to gardening

or wish to have their children take an interest in the garden to hire a laborer to do the heavy preliminary spading or breaking up of the soil. This heavy work frequently disgusts novices and children who would continue to take an interest in the garden if their task was simply to fine and cultivate soil already broken up.

The following amounts of seed the garden specialists of the United States Department of Agriculture say are needed to plant approximately 100 feet of row, or enough to supply vegetables for a family of four:

Snap Beans, 1 pint; Pole Lima Beans, ½ pint; Bush Lima Beans, ½ to 1 pint; Early Cabbage, ½ ounce; Carrot, 1 ounce; Cauliflower, 1 packet; Celery, 1 packet; Cucumber, ½ ounce; Eggplant, 1 packet; Kale, or Swiss Chard, ½ ounce; Parsley, 1 packet; Parsnips, ½ ounce; Salsify, 1 ounce; Summer Squash, ½ ounce; Hubbard Type Squash, ½ ounce.

The following vegetables, the specialists say, will undoubtedly be planted in larger amounts than those just mentioned, and the amounts of seed given will be a guide for ordinary requirements. Some families may need more of the various vegetables and others would need less:

Beet, 4 ounces; Late Cabbage, ½ to 1 ounce; Sweet Corn, 1 pint; Lettuce, 1 ounce; Muskmelon, 1 ounce; Onion Sets, 2 quarts; Garden Peas, 2 to 4 quarts; Radish, 1 to 2 ounces; Spinach, ¼ pound in spring and ½ pound in fall; Late Tomatoes, ¼ ounce; Turnips, ¼ pound; Watermelon, 1 ounce.

The string beans, bush lima beans, sweet corn, lettuce, peas and radishes will not all be planted at one time, but successive plantings two to three weeks apart will be made so as to have a fresh supply throughout the season.

Of early Irish potatoes one peck to one-half bushel will be required, and of late potatoes one-half bushel to one bushel, or more, depending upon the amount of ground available for this purpose. If possible, enough Irish potatoes should be grown to last throughout the winter.

In the event that the family wishes to raise vegetables to supply current needs and also to supply a surplus for canning, the amounts indicated above should be considerably increased.

The home gardener should find useful Farmers' Bulletin 255, Home Vegetable Garden, and Farmers' Bulletin 647, Home Garden in the South. The latter is designed particularly for use in the warmer climates, but contains many suggestions that can readily be adapted by home gardeners in the North. The Department of Agriculture will supply these bulletins free on application as long as its stock for free distribution lasts.

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Foreman for 175 acre apple and pear orchard in Southern California. Must be single and experienced in all phases of fruit culture, especially pruning and pear blight. In answer state age, experience and salary expected.

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The Pacific Coast fruit grower should seek "The man who knows" about spray materials, tree diseases, insect problems and their treatment.

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"Mr. Foster, after graduating from the College of Agriculture of North Carolina, took up the special work of entomology in the graduate department of the Cornell University, and for the past six years has been associated with the United States Bureau of Entomology, spending the greater portion of his time in California, where he is widely known in connection with his valuable discoveries for the control of pear thrips, codling moth and other Pacific Coast problems.

"He is on the staff of our Research and Special Service Department, and in his relations with the fruit growers of the Pacific Coast will adopt the same co-operative principle as that employed by us in the East, and put into practice in the West our policy of rendering service to the fruit growers and co-operating with them in conducting orchard operations.

"He will also have full charge of the Insecticide Department of the General Chemical Company of California. His training and experience, as indicated above, eminently fit him for giving the fruit growers of the Pacific Coast definite and reliable directions for the treatment of their orchards.

"Mr. Foster's long experience in the Western country gives him the most accurate information as to the quality of spray materials required to suit Western conditions, and as to the time and methods of applying them."

We maintain a bureau of information concerning orchard operations, especially spraying. Bulletins giving the best available information concerning the treatment of insects and diseases will be sent you on request. Mr. Foster will cheerfully serve you if you will write, giving as fully as possible a statement of the condition of your orchard. You may be sure the information he gives you will be reliable and beneficial. TRY IT.



ORCHARD BRAND SPRAY MATERIALS are scientifically prepared. There is one for each purpose required on the Pacific Coast. Write for bulletin:

(1) How to control the principal insect enemies and fungus troubles on deciduous fruit trees during the growing period;

(2) The dormant spraying of deciduous fruit trees west of the Rocky Mountains;

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Insecticide Department,
General Chemical Company,
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Please send me free bulletins regarding the control of orchard pests and diseases. I have

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HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

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The 1916 Apple Prices and Factors Connected Therewith.—In previous editions of "Better Fruit" the Editor has repeatedly stated that in his opinion the apple crop of the Northwest must be sold in an intelligent, businesslike way, with proper control, in order that the fruit grower may get the market value of his apple crop. Information is being picked up from a number of growers and indiscriminate shippers who disposed of their fruit without any control, which is very significant. One grower shipped two cars of apples, stating he received about 13 cents per box. Another grower is reported to have stated he shipped two cars of apples, receiving for the two cars \$21. It ought to be evident that apples going to anyone and returning to the grower such ridiculously low prices can be sold by the handler at very low prices, unless they were rotten or frozen, and still make a big margin of profit. The sale of low priced apples prevents other reliable marketing concerns from getting satisfactory prices. A man usually buys where he can buy the cheapest, providing he can get satisfactory service and quality. There are other important factors connected with the average prices being low last year, which fruit growers should overcome during the coming year. While prices on Extra Fancy 4-tier have been fairly good in many instances, the prices obtained on C grade and 5-tier pulled down the average. The quantity of 4½ and 5-tier and the quantity of C grade frequently will mean a loss or profit to the grower. It is surprising to note this year that all districts show an average of approximately 25 per cent C grade, selling at 65 cents per box, frequently less. It is equally surprising to note that even in the best district 25 per cent of the crop was 5-tier, and in some districts and on some varieties 60 per cent going to 4½ and 5-tier. There is no

question about it being a fact that at least 25 per cent of the crop was 5-tier and 25 per cent of it was C grade. That means half of the crop was sold at bottom prices, pulling down the average like blazes. This should be overcome and to a large extent can be overcome. Methods of doing this will be given under separate headings, following this editorial.

Spraying.—Codling moth, scab, aphid and other insect pests are all factors which make Extra Fancy apples C grade. This can be overcome by intelligent spraying, done properly and thoroughly.

Color.—Sunlight, as every fruit grower knows, is a big factor in color. More color can be produced by properly pruning the tree so that the sunlight can reach the interior of the tree as well as the outside branches.

Pruning.—Pruning is not only a factor in letting in sunlight to give more color to the apples, but also a factor in reducing the bearing area of the tree, which if too large means small apples.

Thinning.—Thinning is an important factor in size, as every fruit grower knows, by proper thinning, reducing the crop from three, four and five in a cluster generally to one, occasionally to two, which seems to be the limit, is a big factor in giving size.

Cultivation.—Every fruit grower who has been in the business for any length of time is aware of the fact that proper moisture condition must be conserved to keep the apple crop continually growing during the entire season, to get size. This can be done by thorough and proper cultivation to a large extent in districts where irrigation is not required.

Irrigation.—In some districts, like Yakima and Wenatchee, fruit growers seem to realize the importance of proper irrigation, while other districts do not realize its value in making good sizes. However, it must be borne in mind that 1916 was an exceedingly cool year throughout and undoubtedly the fruit grower did suffer in size, no matter how well his cultivation and irrigation was done. But, nevertheless, it seems wise that everybody should endeavor to do irrigation and cultivation most thoroughly this year in order to obtain the maximum average size and avoid excessive 4½ and 5-tier stock.

Advertising the Apple.—The different districts and selling concerns which have carried on advertising campaigns for Northwestern apples in various sections of the country during the past season feel convinced that the advertising has been a factor in creating a demand for Northwestern apples, consequently bringing the grower additional money, because a good demand always means firm prices and frequently better prices. Not only will all the concerns who carried on advertising campaigns during the past season

continue to do so during 1917, but other selling concerns are also sufficiently convinced that advertising the Northwestern apple is not only a necessity, but a paying proposition. And so the year 1917 ought to see a much more general campaign carried on than ever before, covering a greater territory. This naturally will be so, inasmuch as more concerns will advertise the Northwestern apple in 1917 than during any past season.

Scab.—A very interesting article appears in this edition on the percentage of scab at various heights in the tree. It is an original article, along original lines of investigation, conducted by Leroy Childs of the Hood River Experiment Station, and presents some data in the way of actual evidence obtained by actual counts, which will be very significant and of great value to the fruit grower in connection with spraying for scab. There is no question but what wormy apples are excessive in the tops of the trees, for the same reason that scab is excessive, for the reason that in very tall trees the spray men have not sprayed them thoroughly in the top branches. Along with this it seems wise to suggest heading back trees to a reasonable height. Where the orchard is too old to do this in a very satisfactory way the grower should resort to towers on his tank, so that the tops of the trees can be sprayed as thoroughly as the middle and lower branches.

Buying.—The trend of prices, as everybody knows, has been upward for the past year. Prices on nearly all commodities are still advancing. At the present time there is no reason to assume that prices on anything will be any lower. On the other hand, it is quite probable that prices will continue to advance. It is also pretty generally known that many supplies are short, materials costly and hard to get; consequently it would seem wise for the fruit growers for these reasons to purchase their requirements as early as possible, and also wise to lay in adequate supplies for the season.

RHUBARB

Plant Wagner's Improved Now
Yields \$1,000 per acre annually. Splendid results in six months. Special prices for immediate planting. (Also Berries, Small Fruit, etc.) Write to
J. B. WAGNER, Rhubarb and Berry Specialist
PASADENA, CALIFORNIA

ORCHARD YARN

Listen, Orchardists: Now is the time to tie your fruit trees. All limbs can be readily seen; the spurs are less easily broken off than later; the saving of time is considerable and yarn is probably as cheap as it will be this season. **Orchard Yarn** is the correct method of supporting trees and the saving of a few trees is worth the cost of the yarn for an entire orchard.

Sold by all dealers. If they cannot supply you, please order direct from

The Portland Cordage Company
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New Cyclone Weeder

Death to
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A low priced effective Weeder

Every farmer has use for a good weeder, but until the last few years they have been so expensive that not a great many are used. We designed the Cyclone to serve as a general farm or orchard weeder and to sell at a price that puts it within reach of all. The blades are of fine steel and hold their edges well. They are reversible for use in orchard work which makes the weeder cut in instead of out, thereby avoiding damage to trees. The top of the frame which is of heavy wood is provided with skids and in going from field to field all that is necessary is to turn the weeder over, and it slides over the ground like a sled. Write today for price of the New Cyclone.

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Dear Sirs:
Please send
me circular and
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Cyclone Weeder.

P. O.

YOUR INQUIRIES ARE SOLICITED

The O. S. U. Cider Cocktail

By W. Paddock, State University, Dayton, Ohio

THE Students' Apple Show at the Ohio State University has grown to be an important institution in our college life. It is conducted along lines similar to our state shows, in fact, it surpasses many of them in size, in number of entries, in quality of fruit, in educational value and in value of premiums offered.

It is needless to say that a show of this kind results in a great deal of good. Aside from the intense enthusiasm aroused and the educational value, a large amount of real business must be done. A 28-page premium list is published, in which a quantity of advertising space is sold; space in booths is sold to manufacturers of spraying machinery and of spray materials and to other firms who wish to advertise their wares. Arrangements are also made for the sale of apples, cider, apple pie, and candy made by the co-eds of the department.

Necessarily the financing of a free show of such magnitude is an item of considerable importance, since several hundred dollars is required to meet all expenses, and many schemes are devised to help swell the funds. It is about one of these items that I started to write, rather than of the show itself. Clean cider fresh from the press is relished by most people and our boys

have always made a good deal of money by its sale. This year a new cider drink was devised, which was christened "The O. S. U. Cider Cocktail."

This is made after the fashion of the familiar ice cream soda. A glass is nearly filled with cider, a lump of ice cream is added, then the finishing touch is put on with a small amount of carbonated water.

Some may prefer the addition of a small amount of sweetening in the form

of simple syrup, but if the cider is good this will not usually be thought of.

The popularity of this new drink, new to us at least, at our show prompts us to bring it to the attention of your readers. It would appear to us that this drink, together with similar ones which easily can be devised, should pave the way for the sale of vast quantities of concentrated cider and of apple products. Anyway we hope that some of your readers will take a quart of fresh cider to the nearest soda fountain and have a cider cocktail made. If they don't pronounce it the best ever—we will be glad to hear from them.

"As We Mingle, Prejudice Disappears"

By Charles Uhden, Spokane, Washington

I FOUND this sentence some time ago as a footnote of a blank page in some diary. Having read the same, I turned over the leaf without giving the words any further thought, but after a while they came back to my mind. The more I thought about them the more I was impressed with the meaning contained in the one single line, and finally decided to use them as a subject for a paper intended to serve the purpose of removing the antagonistic feeling which has shown itself, at times very marked, at some of our meetings, as well as at other ones at which I happened to be present.

Prejudice is caused by aloofness or exclusiveness, by too large an amount

of self-righteousness, by envy, and very often by the tirades of parties who wish to endear themselves with us at the expense of someone else. The arraignment of one class against another by unscrupulous persons cannot be condemned too severely. Prejudice is an unnecessary disturber of good feeling and harmony. It causes distrust unnecessarily, doing injustice one to the other. Very often it leads to demand for vicious legislation or at least such as is injurious to business and prevents one from doing his best for others.

In social life, prejudice disturbs peace, it creates discord and makes enemies out of friends; it even has led to crime.



MYERS SPRAY PUMPS

FOR SPRAYING, PAINTING AND DISINFECTING

Have you fruit trees, vines and shrubbery that need attention? If so, be prepared to Spray the MYERS WAY when the time comes. Make your choice from the Myers Line of Hand and Power Spray Pumps, Nozzles and Accessories, and own an outfit you can rely on for real spraying service and your results will be most gratifying.

MYERS SPRAY PUMPS are known and extensively used in every fruit growing territory—Pioneers in the spraying field, with 45 years of pump building experience behind them, they have many practical features and improvements not found on others which insure better spraying with less work. The Patented Cog Gear reduces pumping labor 33 1/3%—The Automatic Pressure Control on Power Pumps eliminates pressure valve and insures uniform pressure. Neat designs, best of materials, hose and fittings, make MYERS Spray Pumps superior for every spraying service.

Write today for new Catalog No. SP17, showing complete line of Myers Bucket, Barreled Power Pumps and Complete Outfits, Nozzles, and Accessories, for every spraying Purpose; also gives valuable spraying information and latest illustrations of codling moth, San Jose scale, Etc.

F. E. MYERS & BRO.,
No. 120 Orange Street
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MYERS HANDY OUTFIT
Holds 12 1/2 Gallon
Ready to Spray

MYERS COG GEAR BARREL OUTFIT
PATENTED COG GEAR

MYERS COG GEAR BARREL PUMP
PAT JET AGITATOR

Complete with Tank and Trucks

(1) Bin selection; (2) field selection; (3) regional selection or the use of certified seed; (4) the tuber unit method; (5) the hill method. Unless provision was made for seed during the past season only the first and third methods are available for selecting seed stock for the coming season.

Perfectly sound tubers free from any evidence of such troubles as wilt, Fusarium rot, black-leg rot or late blight rot should be selected. Such troubles as scab and Rhizoctonia should be kept in mind and it should be the aim to secure tubers as nearly free from these diseases as possible. Wilt-infected tubers can only be detected by cutting a slice from the stem end. Any tubers which show the characteristic bundle browning in the form of dark spots following the bundle ring should be preferably discarded, but if necessity demands it, the bud end may be used, provided the stem end is cut away well below the discolored portion. Tubers or portions of tubers showing any indication of rot should also be discarded. If any considerable number of tubers show bundle browning, it would be advisable to use other stock for seed. In the interests of production the seed tubers should be neither too large nor too small; 2-8 ounces being generally recommended.

Seed may sometimes be obtained from regions known to be free from certain troublesome diseases or "certified seed" may be employed. In the latter case the seed stock has been produced

"CARO FIBRE" FRUIT WRAPPERS

CARO FIBRE is the only real Fruit Wrapper and actually prolongs the life of the Fruit. When wet from shipping in cold storage cars, Caro Fibre forms a silk-like blanket, closing the pores of the Fruit, permitting the warmth to reach the heart gradually as it is exposed to the atmosphere; and as all other papers go to pieces during the period of refrigeration, Caro Fibre is the only wrappers that should be used—naturally bringing a better price for the Fruit.

As to its other merits, hundreds of the largest Fruit Growers can testify to the fact that it is the best.

It picks up easier, packs quicker, looks better.

CARO FIBRE is sold by thousand sheets, not by the pound as others, direct from the Mill to Growers. You get what you buy. It is tied in thousands. You can readily count it yourself. There is no waste.

Give it the water test. Prove what we say. We furnish the

Samples Free

That every Fruit Grower may know more about this wonderful Caro Fibre Fruit Paper, we will mail you samples of Printed Caro Fibre used by the largest Fruit Growers in the country.

Union Waxed & Parchment Paper Co.

MANUFACTURERS

F. B. DALLAM, Pacific Coast Representative
417 Market Street
San Francisco, California

Prejudice makes the one who fosters it miserable. If we but mingled freely, meeting each other with an open and unprejudiced mind, how different conditions would be; how much more pleasant life would be. We would soon see that this old world is a pretty good place to live in. We would soon find that persons whom we have carefully avoided and often criticized severely are not so bad after all; that they are good hearted and whole souled people trying to be fair and inclined to do right and in general of as good principles as we are; that at times there is concealed under a rough exterior a noble character to be admired by all.

Mingling freely is of great value in business; it inspires confidence. We learn to know each other better, also become convinced that we are not the only honest people in the world, but that there are others who are entitled to confidence and can be entrusted with our business.

Mingling freely promotes business. Prejudice restricts and hinders business. Mingling is the best instructor one can have; one learns through the experience of others. It removes narrowness of ideas and broadens our

views. It enables us to distinguish between men and men, and teaches us not to judge a whole class by a single unprincipled individual, but to judge each one by him or herself and upon their merits. In other words, we remember that one black sheep does not make a whole flock so. Mingling will very often show us our own short-comings and prompt us to strive for reform.

Potato Diseases and Seed Selection

State Agricultural College Experiment Station,
Pullman, Washington

The Experiment Station is issuing popular Bulletin No. 126 on "Potato Growing in Washington." Part II, by Dr. F. D. Heald, Plant Pathologist, includes a general consideration of the prevention and control of potato diseases and a description of thirty non-parasitic and parasitic troubles. At this time it is of importance to call especial attention to seed selection as a preventive measure to lessen the losses during the coming season.

Depending on the object to be attained, the grower has available the following methods of seed selection:

CORONA DRY

Arsenate of Lead
Patented June 30, 1913

The "Standard" for Convenience, Economy, Efficiency

One Pound of "Corona Dry" Does the Work of Three Pounds of Paste Arsenate and Does It Better

QUICKLY AND EASILY MIXED—No working up; no straining needed; no sediment; no lumps; no waste—*never clogs nozzles.*

No evaporation—no leaks—no loss of strength. But an *absolutely standard spray mixture*, the uniform strength of which you can depend upon—and know that you have the *highest per cent of killing power.*

"Corona" is safe—it will not burn foliage.

SOLD IN NET WEIGHT PACKAGES
200 lbs., 100 lbs., 50 lbs., 25 lbs., 5 lbs., 1 lb.

REMEMBER—"Corona Dry" means—No guess work, but a Standardized Spray in which the Mixture is Always the Same Strength and Efficiency

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NORTHWESTERN SALES AGENTS **Portland Seed Co.** **Portland Oregon** **Spokane Seed Co.** **Spokane Washington**

under a careful system of inspection under state control. Such seed should show a freedom from the more serious tuber-borne troubles and no more than a certain allowable minimum of the less troublesome diseases.

Yakima Valley Traffic Association

Representing over 90% of the Soft-Fruit Tonnage of the Yakima Valley.

North Yakima, Wash., March 17, 1917.

Whereas, the prices now being asked for fruit paper by the paper mills, being about 100 per cent over those paid in 1916, which makes the cost prohibitive to the grower;

And whereas, a very large percentage of the Northwest boxed apples can be marketed without being wrapped, and show the grower just as good or better net returns as though wrapped, and also make considerable saving in labor;

Now therefore be it resolved, that we, the members of the Yakima Valley Traffic Association, which represents 90 per cent of the fruit tonnage of the Yakima Valley, pack the coming season, without wrapping, at least 65 per cent of the apple crop, and that during the season of 1918 we increase the percentage of unwrapped apples to 85 per cent, the apples shipped without paper being the common grades and common varieties.

And be it further resolved, that a copy of this resolution be sent to all apple shippers of the Northwest, soliciting their co-operation.

(Signed) Yakima County Horticultural

Union, Hays Fruit Company, Yakima Valley Fruit Growers' Association, White Bros. & Crum Co., E. E. Samson Company, Growers' Service Co., Denney & Company, J. M. Perry & Co., Washington Fruit & Produce Co., Thompson Fruit Company, A. F. Carpenter & Co., Pacific Fruit & Produce Co., Lynch-Taylor Produce Co., Richey & Gilbert Co.

The Union Pacific Follows Its Bonus With Another General Boost for Employees

President J. D. Farrell of the Oregon-Washington Railroad & Navigation Company has just made announcement of that company's plan this year to give its employees the privilege of cultivating its right of way and other lands that may be available for such purposes. "This is done," he explains, "as an aid to national preparedness through the production of vegetable foods." No charge will be made for the privilege, and the only condition is that such products as are grown shall be confined to the use of employees and their families.

"Our great family of employees," he adds, "can splendidly assist in the nation's program of preparedness by adding to the food supply, and all who can do so are earnestly urged to take advantage of this offer."

This announcement further provides that lands not applied for within ten days will be offered to others than employees, when suitably recommended, on the same terms. This move brings

into possible productivity a very large area of land as fertile and capable as the average farm, and if the offer can be improved it will absolutely remove from the employee's family expense account the cost of vegetables for an entire year.



BEE HIVES and Supplies

IF YOU own an orchard or keep bees you should have a copy of our

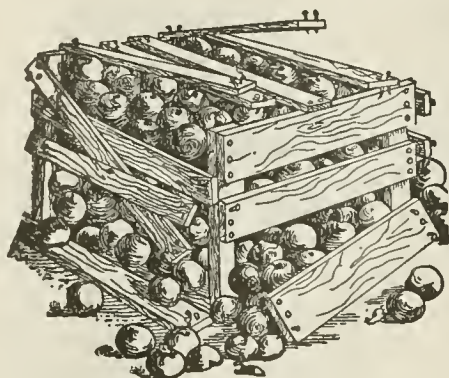
1917 CATALOG of Bee Supplies

Listing everything necessary for the successful handling of bees and production of honey. Gives Valuable Information on Pollination. Tells How to Keep and Care for Bees

Ask for Catalog No. 203

**PORTLAND SEED
COMPANY**
PORTLAND, OREGON





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Western Cement Coated Nails for Western Growers

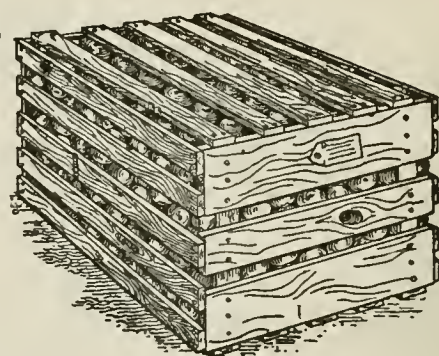
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles

AFTER use of C. F. & I. Co.'s
Cement Coated Nails

Cutting Wisdom Teeth and Orchard Costs

By L. F. Dumas, Dayton, Washington

THE necessity for a more economical production of apples is becoming more and more apparent. In the past we have not given this phase of fruit growing sufficient consideration. When the pioneers of the Northwestern apple industry had proved to their own satisfaction and to the satisfaction of others that there were normal and in many instances abnormal profits in apples, the cost question was pushed aside for questions concerning the best (though not the cheapest) methods of pruning, spraying, cultivation, etc. These things were yet in their experimental stage; but it seemed to be definitely settled at that time, and for all time, that profit would follow in the wake of all plantings where good judgment was used in conjunction with modern methods. So, in association meetings, fruit growers' institutes, bulletins and fruit journals, we discussed the fundamental problems relating to soils, the planting, the shaping and the care of the tree, perhaps forgetting for a time that there was a monetary side to all these operations. If you should take the trouble to go back through the Year Books of this association you would find that only recently has much emphasis been placed on doing things cheaply.—We said, "Above all else let us do them well."

That the result of this policy was of great benefit in developing a superior product is unquestionable. The Northwestern fruit grower has produced apples of "character"—apples of such a character that they have been in demand over other apples from other sections. As long as the supply of our own product was limited, we could, within certain limits, ask and get what we wanted for it. But now we have such an increased production right at home that we must compete not only Northwest with California, and with Colorado and with the large producing sections of the East, but also Northwest with Northwest, state with state and district with district. We are no longer in a position to dictate prices. Now our brother fruit grower across the fence or across the state, who can pro-

duce apples like ours for ten cents a box less, and who is not in the business for his health, can undersell us, or if he can get the same price we get, he can make more than we can. Should we be called on to face a number of lean years, the chances are that he is going to last longer than we are.

Under this new competitive condition, which, it seems, is with us to stay, it is becoming apparent that it will be a question of the survival of the fittest, and the fittest man is going to be the one who can get quality the cheapest. Instead of "quality at any price," then, we must make "quality at a minimum

price" our slogan. Mr. Shepherd has pointed this out repeatedly. He began preaching economy before it was considered "good form" to speak of cheap apples. We are just beginning to heed him. By some, he has been misinterpreted, for they have sacrificed quality to cost. It should not take them long to find out that this extreme does not pay either. But, in general, cost carelessness is gradually giving way to cost carefulness. A few of us are beginning to keep books. A few know just what each orchard operation is costing—a few have made a cost study of each process with a view towards determin-

Statement of the Ownership, Management, Circulation, Etc.

Required by the Act of Congress of August 24, 1912,

of "Better Fruit," Published Monthly at Hood River, Oregon,
for April, 1917.

State of Oregon, }
County of Hood River, } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared E. H. Shepard, who having been duly sworn according to law, deposes and says that he is the editor and business manager of "Better Fruit," and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, Better Fruit Publishing Company. Postoffice address, Hood River, Oregon.
Editor, E. H. Shepard. Postoffice address, Hood River, Oregon.
Managing Editor, E. H. Shepard. Postoffice address, Hood River, Oregon.
Business Manager, E. H. Shepard. Postoffice address, Hood River, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding one per cent or more of the total amount of stock.)

Better Fruit Publishing Company. E. H. Shepard, Hood River, Oregon.

3. That the known bondholders, mortgagees and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

(Signed)

E. H. SHEPARD,
Editor and Business Manager.

Sworn to and subscribed before me this 28th day of March, 1917.
(Seal)

ERNEST C. SMITH,
Notary Public for the State of Oregon.
(My Commission expires August 1, 1920.)

ing efficiency methods and of standardizing these methods. For, during the last five years, we have been cutting our wisdom teeth. It may be that for some of us, perhaps, they have not yet even sprouted. For a larger number their growth has been the occasion of considerable pain, and the pain has extended right down into the pocket-book. However that may be, we have gradually been forced to the realization that fruit growing is "business" and that to make it "good business" we must follow certain business rules.

The primary rule of every producing and selling business is to make the best article possible with the least possible expense. Has the production cost of apples been reduced to the lowest degree consistent with the growing of a superior article? All figures available at this time seem to say that this is not the case. Let us face the facts. Other big industries have cost systems and efficiency experts. Northwestern fruit growers have united in no systematic effort to gain efficiency in their production. By this I mean with particular reference to cost reduction. Many individual growers have sought to reduce costs, but as a body we have done nothing. We have heretofore compared notes on how to fight pests, how to handle soils that are blowing away or are sticking together too tightly, and how to pick and sort and pack our fruit, but we have never come together with the express purpose of finding out how cheaply and at the same time how efficiently these same things might be done.

One of the first steps in an efficiency program is the standardization of each

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The stories are rich in intimate facts of United States history. When you read them you will realize what a great part Union Pacific played in the growth and welfare of our Nation; and how truly serviceable Union Pacific is and will be—in peace or war—to the people of our United States, as individual travelers, or shippers, and as a Nation.

UNION PACIFIC SYSTEM

process in the growing, manufacture, construction or sale of an article. Have we any such standard by which to grow apples? It may be true that conditions are so different on different fruit farms that we cannot attempt to say, it shall cost to much per acre to prune, so much per tree to thin, or so much per box to put fruit on board the cars, i.e., it seems that an absolute standard would be impossible. But at the same time a relative standard which will enable each of us to compare our own cost items with the cost of each step in a process, item by item, as worked out by a number of economical growers, and thus enable us to see where we are possibly spending too much, and are perhaps using the wrong methods—such a system would seem to be a prime

necessity. But how to arrive at such a standard? By a quizz sent out to all growers? That has been tried in getting other information and is not uniformly successful. By means of a paid investigator? We might be more successful this way, but if we are aiming at economy this looks like more expense. We would probably not be willing to dig down into our pockets for very much. Shall we ask the government experts to do this for us? If we do, sometime, somewhere their reports would be printed—it takes a long, long time to get definite results this way. Suppose that, during the time allotted for discussion following the reading of this paper, the members present compare notes on cost items—at best the result would be hazy. In such a short

FORM 513

NOTE: REFER TO BULLETIN BY DATE & NUMBER.

TECHNICAL DEPARTMENT BULLETIN

DATE _____ NUMBER _____

TO ALL DEALERS:

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time and with other equally important matters claiming our attention, we could get at very little of the meat of the cost proposition. So I propose that, instead, a number of us who are really interested in reducing costs shall keep monthly records of the cost of each orchard operation, with full explanations of the methods used in reducing costs, and that we turn these in, to our district inspector or to some other official, who shall tabulate and summarize our reports, and present his summation for publication in our next year's proceedings.

In Oregon Bulletin No. 132, "Econ-

omics of Apple Orchardling," we have the actual costs of different orchard operations given by one thousand Northwestern growers—big growers, small growers, intelligent growers (and growers with less intelligence), economical growers, wasteful growers, and indifferent growers of the "don't know and don't give a d—" type. We also have some well balanced recommendations as to how in a general way we may reduce these costs. But in this study which I propose, we will get the costs and the methods used in reducing costs of a small number of interested men whose endeavor it will be to prac-

tice the utmost economy all along the line. We might make this into the nature of a contest to ascertain who could show the most cost improvement in a year, or a competition to see who could get the best results at the least cost—some such plan as in the boys' and girls' acre of corn or acre of spuds contests.

I believe that one of our inspectors, or one of the State College men, or one of the Federal experts will be willing to undertake the working out of this plan, with the tabulation of methods and of costs. I am sure that I myself am willing to send in monthly cost and

method records. If this plan appeals as a logical way to get at orchard costs there should be a number here who will give their names to the secretary or their inspector after the meeting, that they may be later supplied with blanks and instructions for making their reports uniform. I realize that this means considerable work for whoever goes into it, and suppose there are very few growers here who would deny that they have already more than they can attend to, and because of this such a detailed study of the cost proposition may be passed up. The fact remains, however, whether we like it or not, and whether we like to say so right out in meeting or not, that there has not been much money made growing apples in the last five years, and that if the cost proposition is not reduced down to its lowest terms there will be still less made in the next five years. We've either got to "make good," get out, or get kicked out. So let's either take this scheme, or leave it, and adopt another one. Whatever happens, let us try to find out how to produce our apples at a less cost. I would like to outline in a general way just what a study of costs would consist of, showing what the Oregon Agricultural College Station has reported in Bulletin No. 132 concerning present costs, and drawing what conclusions we may from the few figures available.

Orchard costs may be divided under three main headings: (1) Maintenance costs; (2) Overhead costs; (3) Handling costs. Under maintenance costs we

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and in blossom time, if you want the best apples and other fruits, you must put **new energy** into your trees and plants with

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and you will obtain the largest possible yield of choicest fruit.

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A cup of Ghirardelli's for breakfast will do more than please the taste—it **nourishes**—enables you to do away with more expensive foods.

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include pruning, cultivation, spraying, irrigation, cover crops, fertilizers, thinning, propping and like items. The Oregon bulletin, presenting figures taken from one thousand growers in the Northwest, shows an annual maintenance cost of \$40.75 per acre on trees 10 to 18 years of age—\$40.75 per acre with an average yield per acre of 233 boxes, making maintenance cost amount to 17.8 cents per box. Compared with this are the figures from the same bulletin of an 11-year-old orchard in Idaho with a maintenance cost of \$25.35 per acre, producing 241 boxes to the acre, making a cost of 10.5 cents per box for maintenance. As a further comparison, our figures on Pomona Ranch, near Dayton, Washington, trees 16 and 17 years old: Maintenance per acre \$39.40; yield 351 boxes per acre; maintenance cost per box 11.2 cents. These figures are of value to show, (1) that it is pos-

sible to grow apples at a maintenance cost of around 10 cents a box, which would be a saving of 7 or 8 cents a box over the average for the Northwest, and, (2) that the ability to keep down maintenance cost depends a great deal on getting high yields per acre, every year, with rigid economy in getting these yields.

Under overhead costs we include taxes, insurance, depreciation, salary of manager, interest on the investment. There is a tendency to pass these things by as relatively unimportant. The fact is that they are very important. In the Oregon bulletin Professor Lewis gives the average overhead cost per acre for the Northwest at \$110.76, as compared with \$40.75 per acre for maintenance. This makes overhead figure at 47 cents per box, as compared with 17.8 cents per box for maintenance. It is hard to conceive that fruit growers as a whole

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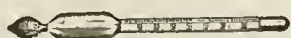
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pay close to 50 cents a box, half of every dollar of returns, for overhead expense. A great variation exists in these costs, however, when we come to consider the individual orchards reviewed in the bulletin, overhead ranging from as low as 20 cents to as high as 60 cents per box in trees 10 years and older. The reason for this lies in the great variability in investment amounts, both original costs and development costs. Some raw land has been rawer than other, and some real estate merchants have bought Pierce-Arrows instead of "Fierce-Narrows." Too many orchards have been planted without enough emphasis being placed on the necessity of paying interest on the investment. As a result, the apples produced, although selling at fancy prices, are having to pay out a large portion of each dollar returned on original investment. In general it might be said that an overhead cost of over 40 cents a box is too high, and that the grower who will survive the chilling years to come is the one who can grow his apples with an overhead of less than 30 cents per box. This cost, from its very nature, cannot be standardized, but a study of it will not hurt anyone.

Handling costs cover two fields: (1) Picking and packing expense, in which we include picking, grading, packing, trucking, hauling, paper, boxes, temporary storage or association charges, putting on board the cars, and supervision. (2) Selling expense, which includes all selling charges. For a thoroughgoing discussion of handling costs I would like to refer you to Mr. Shepherd's paper of last year, in which each item is handled separately, and comes as near being standardized as we can hope to get for some time. Mr. Shepherd gave as his cost of handling for 1915 31.9 cents per box. He said that a saving might be made beyond that of 4.5 cents per box, making total cost of harvesting at 27.5 cents per box. I believe that if we were to ask him he would say that his cost has increased this year, due to the increased cost of materials and increased labor prices. Our cost near Dayton increased from 31.7 cents in 1914 to 35.5 cents in 1916. Picking cost us a cent more, grading amounted to 3.6 cents per box, an increase of 1.6 cents over 1914. To set a price at which apples should be harvested without a great waste, let us say, then, that 32 cents a box is about a standard. Then, taking maintenance, overhead and handling costs, we have 10 plus 30 plus 32 cents, that is, 72 cents cost—i.e., between 70 and 75 cents—a cost at which apples must be raised under present conditions to be profitable. I would like to go into more detail concerning handling costs, but this is an entire subject in itself, so if you are at all interested get last year's Year Book and read Mr. Shephard's paper. Then keep cost accounts of your own, and help in collecting information for next year's meeting.

Winter Kill in Mild Climates

Continued from page 12

trunk. With pears the d'Anjou and Winter Nelis showed much more damage than Bartlett's. d'Anjous on even some of the best rolling, deep, well-drained soils of the state were very severely damaged. Young prunes and cherries showed a great deal of top damage.

The treatment of such damaged trees would naturally vary according to degree of injury. Where splitting occurred and only a few trees were affected, binding the bodies with burlap seemed to be efficacious. Where many trees were damaged, experiments were tried. One method consisted of lacing the bark to the tree, especially along the lines of cleavage, with heavy bill-posting tacks. Very few trees so treated were lost. All sprouts on the trees having trunk damage should be allowed to remain. Where it was possible to secure long scions for bridge grafting, it was very easy to save such trees. Where this could not be done, the growing sprouts might keep the roots alive and could possibly be used in some cases this spring for bridge grafting. If the top dies entirely a new top can be developed from the sprouts, or, in some cases, it will probably be wiser to replant. For pears and cherry trees showing top damage, it was found best early in the season to leave the trees alone. Thousands of trees that at pruning time looked as though they were going to die, showed little or no damage by the middle of June. Those trees which, however, did not show indications of a rapid recovery seem to be improved by a heavy cutting back of the tops. In many cases the trees were found to throw out adventitious shoots and develop a good healthy top. With walnuts which were severely damaged this fall the only remedy would be to cut back to live tissue by early spring so as to allow a proper outlet for the sap. Otherwise there will be an aggravation of a so-called sour sap condition.

One cannot help but feel, in conclusion, that these troubles can to a certain extent be controlled by keeping trees in as nearly a normal condition as possible. Conditions, however, this past year were so extreme that even with such trees some damage could be expected.

Tells of Agricultural Progress of Northwest

E. E. Faville of Spokane, Washington, editor of the Western Farmer, published at Spokane and Portland, Oregon, is in Chicago for a few days for the purpose of inspecting the work and exhibits of the Chicago Herald Land and Industrial Bureau and Exhibition, looking toward representation for the Pacific Northwest.

Mr. Faville, who is markedly enthusiastic regarding the bureau and exhibition, and anxiously eager to have the State of Washington enrolled among active exhibitors and beneficiaries, has interesting things to say of the recent

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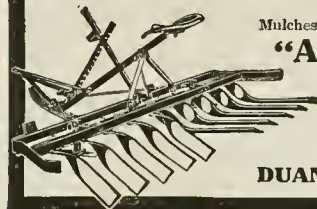
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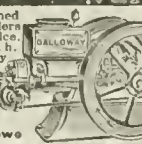


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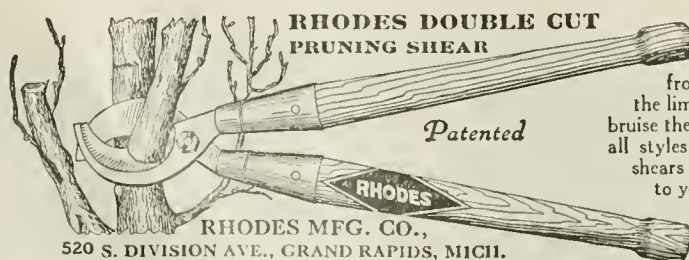
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upward progress and development of Washington and Oregon.

"The rapidity with which these states have adopted a system of diversified farming and live-stock raising has been wonderful," in Mr. Faville's opinion. "Especially has there been a marked increase in the growing of alfalfa and other forage crops—an initial step toward crop rotation and essential to the maintenance of soil fertility.

"The original impetus resulting in this economic advancement was imparted in 1913, when Professor P. G. Holden, prominent in agricultural extension work, conducted 960 meetings in a territory embracing 225 square miles.

"At that time the Pacific Northwest was a buying region. Now it has an annual surplus of food and feeds to sell, and the importation of butter and dairy products has entirely ceased. In the last five years Oregon has increased the number of her dairy cattle 30 per cent, with the Washington increase showing 40 per cent. The increase in other cattle has been much more marked, 120 per cent in Oregon and 370 per cent in Washington. Among the many other promising improvements may be mentioned a system of great terminal warehouses for the handling of the largely increased grain harvests and a better method of handling grain on the farms.

"Other fine movements have been set going also, as, for example, that of better roads and the rural credit system just now receiving united attention from farmers and business men alike. As a result of all this intelligent effort, the earning power per farm in the Pacific Northwest has been increased to \$4,000—the highest in the country.

"Since better farming always leads to better homes and a better people, a splendid school system, in which agricultural education plays an important part, has been built up. The percentage of illiteracy in Oregon and Washington is lower than in any other state."

Mr. Faville knows whereof he speaks when he commends the Chicago Herald Land and Industrial Bureau and Exhibition. And he knows whereof he speaks, also, when he talks of the Pacific Northwest's remarkable gains.

The Tent Caterpillar

With the first warm days of spring the larvæ of the tent caterpillar escape from the eggshells in which they have lain dormant during the winter. Trees infested with larvæ during the early part of the year, or those in the immediate vicinity, are perhaps more likely to be chosen by the parent moth for the deposition of her eggs, and such trees at least should be searched.

The recommendations of the United States Department of Agriculture's entomologists for the control of this pest are, briefly, as follows: As soon as small nests are detected, they should be destroyed, as this prevents further defoliation of the tree. When within convenient reach the nests may be torn out with a brush, with gloved hand or otherwise, and the larvæ crushed on the

ground, care being taken to destroy any caterpillars which have remained on the tree.

The use of a torch to burn out the nests will be found convenient when they occur in the higher parts of the trees. In using the torch great care is necessary that no important injury be done to the tree; it should not be used in burning out nests except in the smaller branches and twigs, the killing of which would be of no special importance. Nests in the larger limbs should be destroyed by hand, as the use of the torch may kill the bark, resulting in permanent injury.

Tent caterpillars are readily destroyed by arsenicals sprayed on the foliage of trees infested by them. Any of the arsenical insecticides may be used, as Paris green, Scheele's green, arsenate of lead, etc. The first two are used at the rate of one-half pound to fifty gallons of water. The milk of lime made from two to three pounds of stone lime should be added to neutralize any caustic effect of the arsenical on the foliage. Arsenate of lead is used at the rate of two pounds to each fifty gallons of water.

On stone fruits, such as cherry, peach and plum, arsenicals are likely to cause injury to foliage and must be used with caution, if at all. On such trees the arsenate of lead is preferable, as it is less injurious to foliage, and on all trees it sticks much better. In spraying for the tent caterpillar only, applications should be made while the caterpillars are yet small, as they then succumb more quickly to poisons than when more nearly full grown, and prompt treatment stops further defoliation of the trees.—Office of Information, U. S. Department of Agriculture.

Potato Bulletin

The high price of potatoes at present has stimulated renewed interest in their production and the acreage of the country will doubtless increase materially the coming season. The yield and quality of the crop will depend very largely on the character of the seed bed and the character and condition of the seed. Mindful of the importance of these factors, the Washington Experiment

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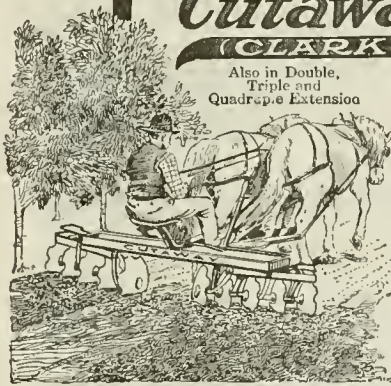
Orchard tillage pays as big as field tillage—especially where it is carried close. Note the illustrations below—see how the cultivation extends beyond the team and under the low limbs. Here you have the orchard tool of unsurpassed efficiency—the

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They have CUTAWAY (CLARK) cutlery steel disks, forged sharp. Close up into a regular harrow for field work. Light in draft. The single action is reversible. If your dealer has not the genuine CUTAWAY write to us direct. Be sure to write for our new free book, "The Soil and Its Tillage." Get your copy now.

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THE OLDEST BANK IN HOOD RIVER VALLEY

Station at Pullman has just issued a comprehensive bulletin dealing with potato culture, potato diseases, and pests. The first part of the bulletin is by Professor Morris and deals with the types of soil, preparation of the seed bed, selection of seed, planting, cultivation, harvesting, etc., of the potatoes. The second part of the bulletin is by Dr. Heald and deals with the numerous

diseases of the potatoes and methods of combatting the same. The third part, by Mr. Yothers, deals with the various insect pests and methods of controlling the latter. The bulletin contains some 120 pages and is illustrated in detail. It will not be sent to the regular mailing list of the station, but may be had upon application to the experiment station.



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One of the largest and most thorough orchardists of the entire West says:
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"First—It remains in suspension better than others.

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"It is almost impossible to find a wormy apple on any of my ranches. Less than 1% will cover all my losses in that respect."

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Twelve years of unvarying, successful and satisfactory use throughout the Northwest. Always uniform, dependable and effective.

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Salem Fruit Union Salem, Oregon
Apple Growers' Association Hood River, Oregon
White Salmon Valley Growers' Association..... White Salmon, Washington
Wenatchee Produce Co..... Wenatchee, Washington
C. R. Paddock Produce Co..... North Yakima, Zillah and Grandview, Washington
Yakima Fruit Products Co..... North Yakima, Washington
Selah Fruit & Cold Storage Co..... Selah, Washington
R. M. Wade Co..... Spokane, Washington
Valley Fruit & Produce Association..... Walla Walla, Washington
Denney & Co..... Payette, Idaho
Victoria Chemical Co., Ltd..... Victoria, B. C.
Erb Hardware Co..... Lewiston, Idaho

Discussions at Ninth Apple Show

Continued from page 10

munities have been bitten and taken steps which showed poor judgment.

Question: Is it as easy to dispose of evaporated fruit as any kind of fruit?

Dr. Caldwell: Yes, taking a period of years into consideration. The volume of evaporated apples fluctuates directly as the apple crop of Western New York because 75 per cent of the evaporated apples are made there. This year their crop is short; some of their evaporators did not run more than two weeks, as against 80 or 90 days in ordinary seasons. Their output won't be 10 per cent of what it has been during the last five-year period; that means that the total volume put on the market this year will be about one-third of the 1913-1914 output, which was normal. That, of course, means high prices over the next eighteen months.

Question: Are apples held over from one year to the next of good quality?

Dr. Caldwell: If dried to 27 per cent moisture they are very nearly as perishable as fresh fruit; they can be handled only during the cold months and they deteriorate promptly as soon as shipped into warmer territory. I may say that the New York producers have absolutely slain their Southern markets. For the past seven or eight years it has been practically impossible to find on the market of one of the Southern States an apple made in New York, for the simple reason that they won't keep and the dealer must get rid of them while the cold weather lasts. That is not true of the Virginia product. I have over at the Apple Show samples coming from five evaporators in Washington or Oregon, which have been kept in my laboratory in the open in an ordinary wooden packing box for 9½ or 10 months and no deterioration has occurred. Those samples were evaporated to 22 to 24 per cent moisture. I see no reason why they should not be kept five years.

Question: What would be the increased cost of drying to 22-24 per cent moisture?

Dr. Caldwell: No increase for labor and an increase of about 5 per cent for fuel and a cutting down of the volume to be handled of about 5-6 per cent. The larger portion of the difference in the water content would be taken out not on the dryer itself, but in the carrying room.



Pruning Expenses

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Growers and Shippers of

**Yakima Valley Fruits
and Produce**

SPECIALTIES:

Apples, Peaches, Pears and Cantaloupes

TOPPENISH, WASHINGTON

Question: If you wanted to start a by-products plant in your community, would you try to interest private capital or have an association concern?

Dr. Caldwell: The associations will have to handle this business of necessity in the final analysis. So long as your acreage is made up of 25 per cent of varieties which are consistently unprofitable, the association will have to come to it, not next year or the year after, but in five years to come they will have to do it to save the grower from himself. The association will have to take steps to keep those varieties out of the market. They can't do that until this thing has gone on until prices for all varieties have been beaten down below the present level, until the seriousness of the situation is realized by everyone concerned. When that time comes the associations will have to take up themselves the burden of carrying the fellow whose orchard is made up of these undesirable varieties. That can only be done by the by-products plant. I will say of those 83 per cent of by-products plants that failed, that 60 per cent were fore-ordained and predestined before the first nail was driven in the building, for it was perfectly clear to anyone that the thing could do nothing but fail. Of course the remaining 20 per cent failed because co-operation was not co-operation in that particular district. The fault lay at the door of the grower. He wouldn't make long-term contracts. The cannery can't exist from year to year with no definite business basis for operation.

Question: Of course you would advise associations to get busy before those real hard times come?

Dr. Caldwell: That is the reason for my existence. A good many of us see those hard times coming.

Chairman: What would be the cost of drying apples?

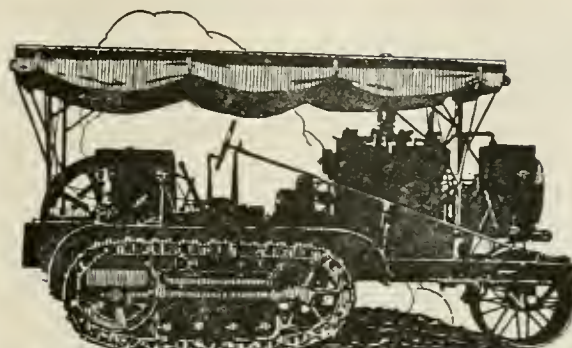
Dr. Caldwell: From \$5.25 to \$7.00 or \$7.25 per ton; \$5.25 assumes that the factory is going to run 120 to 180 days, beginning with berries in July and continuing work until Christmas when it finishes with the apples; \$7.00 is on the assumption of an average length of running not to exceed 90 days. This will be the manufacturing cost per ton of dried fruit.

Question: What is the objection to the private concern?

Dr. Caldwell: Simply that you haven't it. The private individual rarely has the capital necessary to put up a plant of sufficient size to cut any figure in the reduction of the waste of the community. He usually builds because of lack of money, on a scale to save his own waste, and that is in most cases too small to be profitable and is usually abandoned in a few years for that reason. So that he neither helps himself, his neighbor or anybody else.

Question: I had figured that the objection to the private concern was that it would not pay the grower a fair price for his fruit; how is that?

Dr. Caldwell: The only answer to that question is whether the supply of



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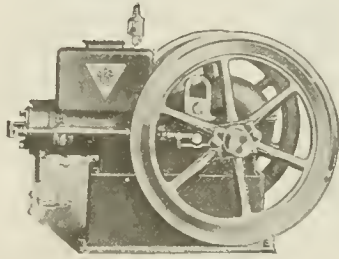
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Watsonville, California

ELMER HIGGINS, 934 Henry Bldg., Seattle, Wash.

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Can Only Be Accomplished by the Use of Efficient Pumping Equipment



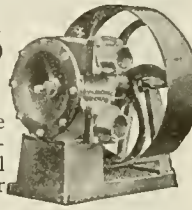
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material is so great that he can get what he wants without paying a fair price for it. Ordinarily, I believe, there is not any great danger that the grower will not get fair treatment from the private individual. At least it is not so in the private plants of which I have any knowledge. The grower is getting about all he could reasonably expect.

The private individual must have what amounts to co-operation on the part of the growers. If he is building a plant on the assumption that he is going to run 180 days of the year, beginning with loganberries, etc., and the grower puts his fruit on the market fresh for two or three years because he finds it more profitable, then that private individual is going broke. You will not get private capital to build without the assurance that he can provide himself against such a condition as that. Bankers and men with money say they will not put \$10,000 or \$15,000 into a community for by-products because the grower will have no interest and he will step from under when he can dispose of his fruit for 10 cents more a ton than they can pay.

Mr. Leedy: At the present price of evaporated apples, what can the evaporator afford to pay the grower for green fruit?

Dr. Caldwell: \$9.00 or \$10.00 a ton.

Mr. Doty: Will the present desirable varieties continue so?

Dr. Caldwell: Of course I can't say definitely. Of course we know that the variety which is the most desirable in one state is not the most desirable in the next state. The highest priced apple in New York is not the highest priced apple in Philadelphia or Chicago. Of course we can't say that the apple which is the highest priced now will be so ten years hence.

Mr. Paulus: But you can reasonably state that apples which are undesirable at the present time will continue to be so.

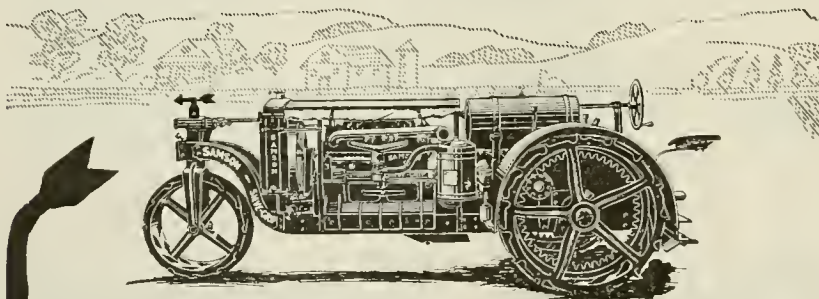
Chairman: How many tons of culls should be provided for per acre each year—what is the average?

Mr. Green: At White Salmon we count about one-half ton.

Mr. Van Holderbeck: One and one-half tons per acre in a bearing orchard.

Dr. Caldwell: Evaporation must not be considered a panacea for growers' trouble. It offers possibilities of help, but everywhere there are very definite limitations upon those possibilities, and those limitations must be clearly understood. I think that very great harm has been done here in the Northwest by a few misinformed people, by reckless and enthusiastic people who have presented statements of the possibilities which were very wide of the facts. The net result has been that it disgusted the grower who investigated when he found out that he had been misinformed, and in two or three cases where evaporators were started there has been extreme dissatisfaction, the growers feeling that the man in charge was imposing upon them.

Mr. McKee: Over how long a period did you gather data of the average price of the dried products?



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Dr. Caldwell: Over a period of two years here in the Northwest for a monthly average and in an intermittent, gapy fashion over a longer period, and for the New York markets over a much longer period, and it is to those markets that we must look rather than to the markets here in the Northwest, for the reason that those are the fellows who will determine what we are going to get for our product when we come into competition with them for the foreign markets. That is the established market and it is the one which will pull down any high prices we are getting here as soon as our products reach it and come in conflict with it.

Mr. Hanauer: We have grafted over some of our undesirable varieties into Rome Beautys and have gotten from 20 to 30 boxes to the tree. I wouldn't urge anyone to pull out his trees if he is fortunately located. We wish all our apples were Rome Beautys.

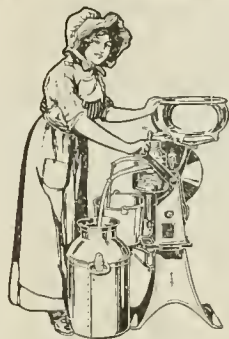
Question: Does it pay to top graft worthless varieties to profitable ones?

Twelve voted in favor of it, eleven against it.

Mr. Van Holderbeck: It does not pay, at least it will cost more than it is worth.

Mr. Paulus, Salem Fruit Growers' Association, Salem, Oregon: The by-products plant at Salem is the best situated of any by-products plant in the Northwest, but down in Salem we don't call it a by-products plant but a fruit-products factory. Our association was organized in 1909 with a membership of 160, which has since increased to 525. Our volume of business is over one-half million dollars a year and we are handling the products off of 2,500 acres of prunes, about 1,000 acres of loganberries and about 3,000 to 4,000 acres of other fruits, small fruits, cherries, apples, etc. We don't handle many apples and we have not encouraged anybody to put out many. We were, however, the means of getting one of the largest apple-juice factories in the Northwest started, the Northwest Fruit Products Plant at Olympia. When the state went dry it made it necessary for the State Brewery Association to find another business. I went to the manager and board of directors and for about three months worked with them to start a loganberry-juice factory. Before that our board of directors had appropriated \$2,500 to make experiments with loganberry juice. We had an oversupply of loganberries and unless we had developed the juice business we would have been goners. We made a great many experiments in connection with Professor Lewis, who furnished us a man who started in during the season making juice and making notes of the different processes. After about three months' work I got the brewery people to consent to go into the loganberry-juice business. I think there are now about fifteen loganberry-juice factories making a total of about one-half million gallons of juice.

We dry loganberries, cherries, apples, etc. We have not found it profitable to compete with California peaches, which are sun dried. This year we handled about 3,000,000 pounds of prunes, which



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And now, in the De Laval machines for 1917, a number of new and still further improvements have been made, which make the De Laval machines of today much better in many respects than they have ever been before.

Their capacities are greater per dollar of cost; they skim cleaner under the more difficult conditions of separator use; they are equipped with the most improved speed regulator, thus insuring the proper speed necessary for complete separation; they are even better lubricated, and the bowl construction is even more sanitary than ever.

In other words, superior as the De Laval machines have always been to all would-be competitors and utilizers of abandoned De Laval features, the De Laval machines of 1917 are improved and superior in every way to all previous types and models of De Laval construction.

All these improvements and new features are described and explained in the new 1917 De Laval catalog now ready for mailing, but some of them are difficult to describe and make fully understood by words.

Be Sure to See a New De Laval

The new De Laval machines themselves best explain their new and superior features, and their use does this more completely and convincingly than even an examination of them. Every local agent is glad to afford opportunity for examination, and better still, for home test of a new De Laval machine.

But the demand for the new machines is a month ahead of the possible supply under the present difficult conditions of manufacture and freight distribution. More De Laval machines by half have been made in 1917 than ever before, but the De Laval Works is now ten thousand machines behind actual orders, and the demand is ever increasing.

Hence, the importance of securing a machine quickly if your local dealer happens to have one, and of ordering well ahead if he does not. And likewise, the importance of waiting patiently a little for a machine if need be.

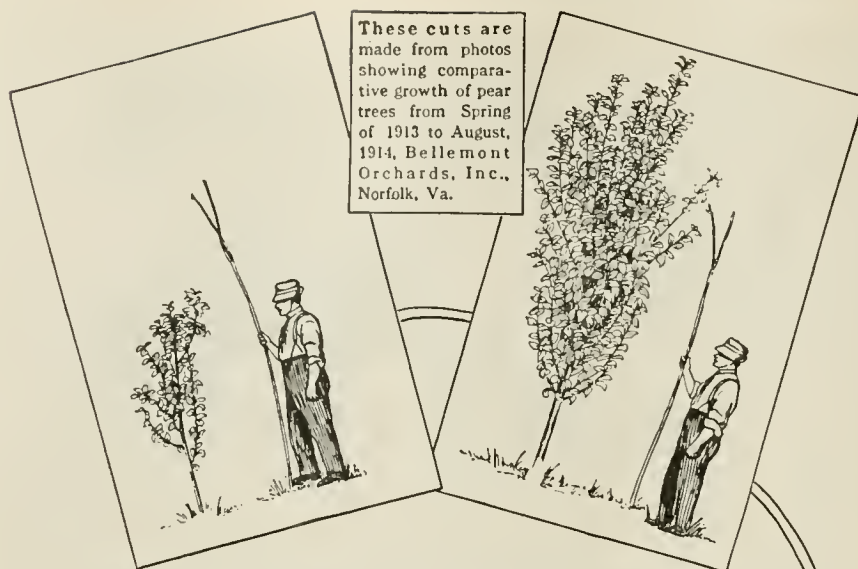
A new De Laval catalog will be gladly sent on request, and if you don't know your nearest local agent please simply address the nearest De Laval main office as below.

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LARGEST DAIRY SUPPLY HOUSE ON THE PACIFIC COAST. We specialize in Alpha Gasoline and Distillate Engines, Ideal Green Feed Silos, Irrigation Equipment, Centrifugal and Deep Well Pumps and Alpha Spraying Outfits. Send for special catalog.

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Get ready now for spring planting. Last year thousands of farmers and orchardists who wanted to plant in blasted ground had to plant in the old way because they failed to order in time a supply of

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Explosives are slow shippers. They require from 4 to 6 weeks for delivery. If your dealer does not carry Red Cross in stock, don't take a chance on delay. Now is the time to place your order with him.

Get the Full Information

Learn how to use Red Cross Farm Powder and what it is doing for thousands of farmers and orchardists everywhere. Our book is a modern education in up-to-date methods of tree planting, orchard rejuvenation, stumping, sub-soiling, ditching, etc. You ought to have it. Send now for

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will go in carloads to thirty-two different cities. We have a car going to New York, Norfolk, Pittsburg, Boston, Philadelphia, Louisville, Buffalo, Montreal, Winnipeg, Saskatoon, Calgary, Portland, Seattle, Superior (Wis.), Minneapolis, St. Paul, Omaha, St. Joseph (Mo.), Atchison, Wichita, two cars to Kansas City, Memphis (Tenn.), Guthrie (Okla.) and Dallas (Texas). In addition we will put a couple of cars in England. We had arrangements made to market in all European markets when the war broke out. This year the British government is only allowing 50 per cent of dried fruit to be imported that was brought in last year, so we were only able to ship a couple of cars, although we could have sold a great many more had the embargo been off.

I have been very much interested in the discussion this morning for the reason that we have had to go through during the past seven or eight years

what you people are just starting into. If you people are going into the dried-fruit business you have got to go into it and stay in it; you can't expect to use it as a relief one year and not have a dried product the next year. People expect to get fruit from you year after year. If you don't provide for the maintenance of your dried-fruit business, if you dry one year and ship fresh fruit the next year, the following year when you go into the markets you will find that your people have made arrangements somewhere else.

It may interest you to know something about the dried-loganberry business. Several years ago there were a great many people planting loganberries. The dried loganberry went fine on a limited scale, but it wasn't any length of time until there were 2,000 acres set out. In 1913 there were about three carloads which were marketed at profitable prices. When the big over-

supply came the growers naturally turned to the unions to help them out of their trouble. In 1915 we took in 367,000 pounds of dried loganberries as against three cars of the year before. The marketing of that quantity of berries immediately became quite a problem. The growers didn't feel in a position to dig up several cents a pound for advertising. We had advanced to the amount of \$43,000 on that crop, which is what I would call a bone-head stunt. We were practically advancing 10 cents a pound against a product for which there was no market, and we would be obliged to get that 10 cents because we could not get it out of the grower. The next year the same process was repeated. We advanced \$37,000 more. In 1914 we had sold about \$28,000 worth, leaving us \$15,000 in debt when we went into the 1915 crop. About that time the manager became sick and slid the dried-fruit department upon me.

It finally became apparent that interest and insurance would eat up the profits faster than advertising. Finally, after a good deal of argument with the board of directors and a night session, we decided to go into the advertising and put salesmen on the road and introduce loganberries in different places,

**real
refinery
gasoline
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STANDARD OIL
COMPANY
(California)



WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

with the final result that this spring we still had a debt of \$29,000, and we were going into the next season. If we could not move those berries we were doomed. Necessarily we did some fall plugging. By the first of June I had that \$29,000 all back and within three months I had sold the balance of those crops and the 1916 crop, making the total sale for this year one-half million pounds.

I want to commend Dr. Caldwell on his fearlessness. He has made several statements in regard to by-products that are absolutely the truth. If you will go down into Oregon into almost any town you will find the wreck of a cannery which was either promoted by some manufacturer or by some misguided person who had the interest of the community at heart but lacked the judgment necessary to put that kind of a plant through. In the dried-fruit business there are not so very many associations; there are four in Oregon. We have in Salem two fruit-juice factories, three dried-fruit packing plants, two large canneries and three vinegar plants. There is one thing that we have our evaporators for. We are troubled during the ripening period of cherries with rain, which in some seasons causes 40 to 50 per cent of the cherries to crack on the trees. We dry those cherries and we have found by a great deal of pushing we can get a market for those cherries. The same is true of our other dried fruits; we have practically had to create a market. We are getting good prices this year for our prunes in spite of the war on account of the short crop in California. We are not encouraging anybody to put out loganberries now until we see how the juice takes. If it takes well there will be great possibilities and extension in the loganberry field.

J. B. Felts, Opportunity, Washington.: There are two sides to this co-operative proposition. This gentleman has the statistics down from the manager's side, but is the grower making a living—what amount does he get per acre?

Mr. Paulus: Down in Salem we make a living off our land. We figure our orchards are worth from \$200 to \$350 an acre. If you keep the price of the land down you can make a living. We have had a couple of failures in the prune business. Up to three years ago we had had only one failure, but we have had three bad years out of five.

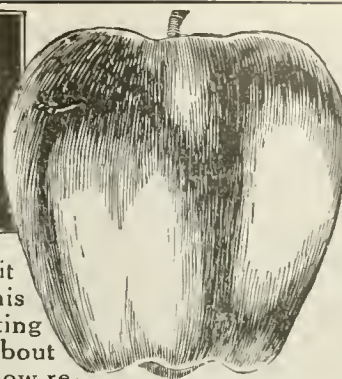
Question: If you were in a strictly apple district what would you propose?

Mr. Paulus: I would hate to tackle any by-product, especially evaporating, on one product alone. You have got to have a variety of stuff to handle to enable you to go on the market. It might be possible to specialize on apples if you could get great enough tonnage and put up an especially fine pack.

Question: In your district you raise blackberries and other small fruits as well as loganberries?

Mr. Paulus: The canners pay so much for these fruits that we can't afford to create a market for them. If the loganberry juice pans out I think we can pay three cents a pound for the loganberries.

Grow Apples Like This—



Others do. You can. Choice fruit pays big. Learn how to grow this better fruit with fewer culls, by writing for our Apple Booklets. Tell all about Aphis, an active carrier of blight, now regarded by many growers as the most destructive apple insect. Aphis, Woolly Aphis, Red Bug, Leaf Hopper and other similar

Orchard Pests Controlled

Black Leaf 40 kills on contact. Use separately, or combine with Lime-Sulphur, Arsenate of Lead, Bordeaux, and other sprays as directed, making one spraying do the work of two or three. Endorsed by Experiment Stations and Agricultural Colleges.

Spraying time is here, so write today for these three helpful booklets, "Bug Biographies," "How to Control Apple Aphis" and "When to Spray." These booklets have saved fruit growers thousands of dollars. FREE to every apple grower. Write today.

THE KENTUCKY TOBACCO PRODUCT COMPANY, Louisville, Ky.
INCORPORATED

Black Leaf 40
40% Nicotine

Kills
Aphis

Announcement to Fruit Growers

A Correction Through an oversight the copy for our advertisement in this magazine last month was forwarded by the advertising agent to the printer before the proof was submitted to us.

As a result the copy contained an incorrect statement to the effect that aphis is "more dangerous to orchards than scale or blight."

Fire blight is a more serious menace than aphis. If a tree becomes infected, the infected part should be cut out and burned, as the infection is easily spread from tree to tree.

Aphids help spread the disease; one reason—a very important one—why you should control them. This is easily accomplished by properly spraying with "Black Leaf 40."

However, the most important point we wish to make clear at this time is that, although aphids help spread fire blight, injure fruit, curl the leaves and weaken the trees, blight is more dangerous.

V. I. SAFRO, Entomologist

THE KENTUCKY TOBACCO PRODUCT CO.

INCORPORATED

Manufacturers of "Black Leaf 40"

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ONE OF A THOUSAND
"I never was a great friend of the shovel, and since I have used the MARTIN, the shovel and I have entirely dissolved partnership." F. H. LYTLE, Pioche, Nevada.

DITCHES!

Make the NEW and Clean the OLD with the MARTIN Ditcher, Dyker and Grader. Makes or cleans irrigation or drain ditches up to 4 feet deep—any width. Makes two to three foot dyke or levee; grades roads. Works in sand, rocks, gumbo or clay—wet or dry—on side hills or level ground.

Reversible, Adjustable, No Wheels, Cogs or levers. Nobreakable parts. All steel. 2, 4 and 6 horse sizes. Guaranteed to do more work than 50 men with shovels. Cost low, upkeep nothing. Over 10,000 satisfied customers everywhere. Write TODAY for catalog, full particulars and introductory offer on new 1917 models.

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560 Evans Block DENVER, COLORADO



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Most of us know something about this honey-money and most of us appreciate the value of bees to the orchardist; but what so many of us don't know is the positive enjoyment to be gotten out of bee-keeping; the simplicity of it, and how very little it takes to make the right kind of a start. Write for **SPECIAL OFFER TO BEGINNERS** Where you live doesn't matter—how much or how little space you have available for hives doesn't matter—nothing new even about pounds of delicious, ready-selling honey from small backyards.

If you already have the bees working for you, you'll be interested in the advantages of the

Root Double-Walled Buckeye Hives Keep the bees warm in the winter—no matter what the outside temperature.

Send for **COMPLETE DESCRIPTIVE CATALOG** of Root bees and bee-keeper supplies—tools, clear glass jars, honey-comb cartons, section honey boxes and shipping cases, etc.

THE A. I. ROOT CO.
Medina, Ohio



BUY AND TRY

White River Flour

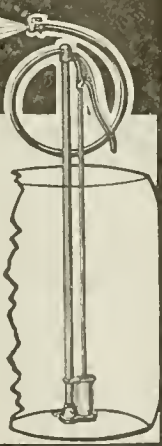
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Whiter, Lighter
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The simplest spray pump made. No suction. No packing to wear out. Pressure of 115 pounds can be reached. Use in bucket, keg or barrel.

Will Spray Any Liquid Any disinfecting fluid, whitewash, water color paint or crude oil can be used in this pump. No sediment can get in. Your mixture can not settle—the pump keeps it agitated. Nothing to break or wear out. Strong material. Weight 18 pounds. Write today for full description. Dealers wanted where not represented.

Peoria Hydraulic Pump Co.
Peoria, Illinois



Relation of Height of Fruit, Etc.

Continued from page 8

specialize his spraying equipment along with the demands of his orchard. The small-capacity outfit, which did splendid work during the earlier years of orchard growth, should be replaced by a machine of high power and larger capacity in order to cope with the expansion of foliage surface which is yearly increasing and which demands just as speedy attention as did the trees when they were smaller. The machine for the older orchard should possess sufficient power to permit the operation of three leads of hose—two to be operated from the ground and the third from a tower constructed on the outfit. The rodman in this latter position can not only easily cover the tops of the trees but he can direct and oversee the work of the other men and inform them of parts of the trees that have been missed. Spraying from the lower insures the covering of the upper leaf surfaces, an accomplishment which is otherwise practically impossible in the case of large trees.

Pruning

Pruning should also prove of much benefit in reducing this tree-top infection. The cutting away of live or six feet, in the case of long straggling branches from which it is impossible properly to pick fruit, would not only reduce the time and cost of spraying but would also remove that part of the tree which is most easily neglected, and which, when neglected, scatters more scab spores advantageously than any other part of the tree.

Losses resulting from failure to spray the tops of trees thoroughly are not confined to apple-scab infection, but include all insect pests and plant diseases. In the case of most insects, their depredations cannot be tabulated in the same way as those for scab, owing to their movements over the tree. Reinfestation from the fruit-tree leaf roller, the woolly and green aphids, have been observed by the writer to result from a failure to hit the tops of the trees while spraying for these pests.

Suggestions on Beautifying the Farmstead

By V. V. Westgate, Assistant Professor of Floriculture and Gardening, Washington State College, Pullman, Washington

WHEN we think of a farmstead we picture in our minds, usually first of all, the farm buildings. As this picture develops, trees and shrubs should come before the mind's eye. In other words, then the appearance of a farmstead will depend very largely upon the buildings and plant materials. If such buildings are well constructed and properly located and the plantations of ornamental material are well worked out, the effect should be artistic.

The farmhouse should occupy a position in the foreground, as regards the other farm buildings, since it is not only the most important structure on the farm, but usually the most attractive as well. Other farm buildings ought

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to be located at a reasonable distance to the rear of the house. Their exact positions with respect to one another should be such as will get maximum convenience and economy (this is a study in itself and is not included in this article). At times the lay of the land demands that the secondary farm buildings be nearer the highway than the house, but where such a condition is forced nothing by way of appearance is added.

Economy, as well as ornamentation, demand that all farm tools and machines be housed, which buildings, along with barns and other structures, should be kept in a neat appearance. Applications of paint at reasonable intervals will do more to produce this desired effect than anything else. Some prefer, when painting farm buildings, to use one color on the house and another color for the other buildings. Although this plan is not a bad one where the colors are carefully chosen, I, personally, prefer uniformity throughout. Light colors such as gray, drab or light brown are very good.

When considering plant materials, their use as windbreaks deserves first consideration, though the importance of this varies much in different localities. In some places in the State of Washington the value of a windbreak is largely to lessen the effects of dust storms. In other sections we keep off hot or cold winds, as the case may be. Of course, it goes without saying that windbreaks should be placed on the sides of the farmstead where they will do the most good. For most parts of the state windbreaks are of value on the southwest. A double row of Red Fir, Norway Spruce or Scotch Pine set 10-12 feet apart will give excellent protection in a few years. Evergreens, as the preceding, are preferable to deciduous forms, since they maintain their leaves during the winter months.

Partial views from the house toward certain of the farm buildings may at times be rather attractive, but I am safe in saying that an absolutely unobstructed view toward the barns and feed lots is never so. A few trees and



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shrubs should therefore be placed between the house and such objects. Such plant material should be placed at some little distance from the house so the lawn or yard will not be too much broken up. When shutting off poor views, always be careful that the plantations are not so far extended as to hide scenes which are attractive, for it is as important to preserve good views as to get rid of disagreeable ones.

Sufficient shade for the farmstead can be provided by using few trees, providing they are of the proper kinds and are well placed. Never attempt to hedge in a place with shade trees. Too heavy plantings cause damp, unhealthy conditions as well as preventing views to and from the place. Two or three tall broadly-spreading varieties such as the Ash and Hackberry ought to be placed on the sunny sides of the house. One or two large trees should be planted to the rear of the house as a background. In case the house faces toward the north one lot of trees will serve both purposes. A scattering of trees should be planted around the barns for shade and ornament.

When planting trees preserve good open-lawn areas. This same rule should apply with force when locating shrubbery. Most farmhouses look well with a scattering of shrubs at their base. Such material unites the house to the lawn in an artistic manner. Considerable shrubbery can be massed at the sides and to the rear of the place. Shrubs should not be scattered over the front yard, but, as mentioned before, this should be left almost entirely open.

When selecting trees and shrubs for planting, choose those adapted to your soil and climatic conditions. The average farmer cannot afford to run an experiment station for testing plants of uncertain qualities. However, this in no sense limits his selection to three or four kinds. When the farmer desires 15-20 trees it is not necessary that he pick all Box Elders, as many have done. If he is located under average soil and climatic conditions he has a large number of good forms to pick from.

Too much planting is a common fault of most farmers when beginning landscape improvements. But comparatively few trees and shrubs are needed, provided they are carefully placed. Flower beds, consisting of common annuals and perennials, should be largely avoided on farmsteads. Such plants, though giving good effects when well tended, require too much care during the farmer's busiest season, and for that reason are of little value. Where weeds are allowed to develop among the flowers in the beds, the effect is worse than if no such flowers were used at all.

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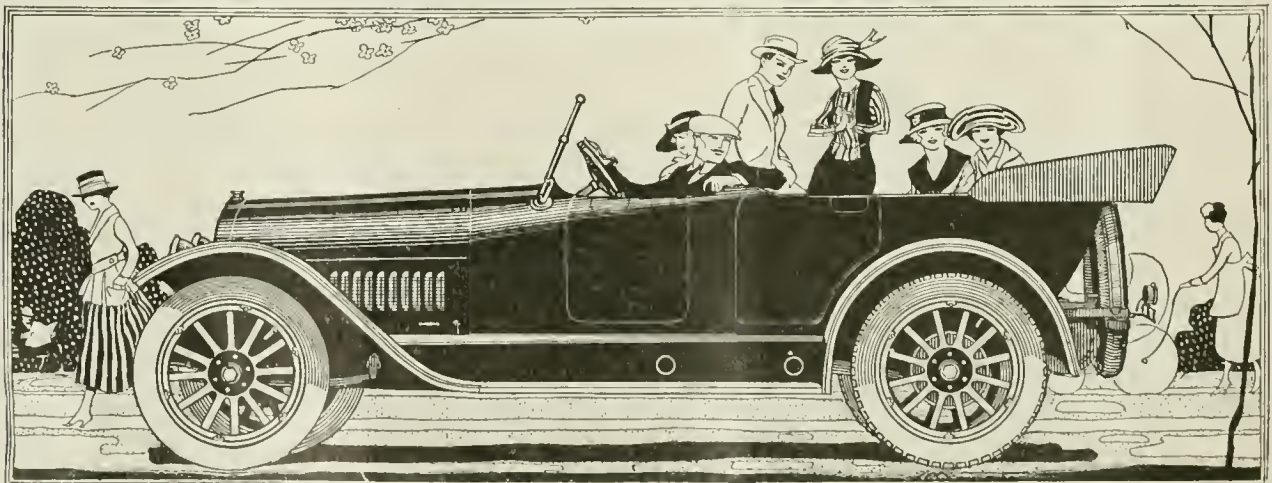
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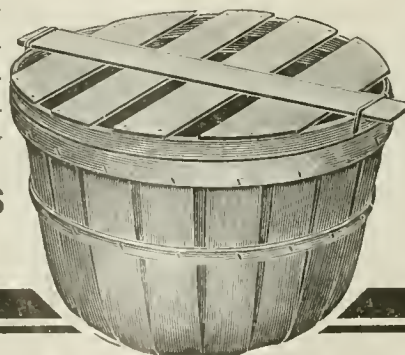
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The White House

Washington

My Fellow Countrymen:

The entrance of our own beloved country into the grim and terrible war for democracy and human rights which has shaken the world creates so many problems of national life and action which call for immediate consideration and settlement that I hope you will permit me to address to you a few words of earnest counsel and appeal with regard to them.

We are rapidly putting our navy upon an effective war footing and are about to create and equip a great army, but these are the simplest parts of the great task to which we have addressed ourselves. There is not a single selfish element, so far as I can see, in the cause we are fighting for. We are fighting for what we believe and wish to be the rights of mankind and for the future peace and security of the world. To do this great thing worthily and successfully we must devote ourselves to the service without regard to profit or material advantage and with an energy and intelligence that will rise to the level of the enterprise itself. We must realize to the full how great the task is and how many things, how many kinds and elements of capacity and service and self-sacrifice, it involves.

These, then, are the things we must do, and do well, besides fighting,—the things without which mere fighting would be fruitless:

We must supply abundant food for ourselves and for our armies and our seamen not only, but also for a large part of the nations with whom we have now made common cause, in whose support and by whose sides we shall be fighting.

We must supply ships by the hundreds out of our shipyards to carry to the other side of the sea, submarines or no submarines, what will every day be needed there, and abundant materials out of our fields and our mines and our factories with which not only to clothe and equip our own forces on land and sea, but also to clothe and support our people for whom the gallant fellows under arms can no longer work, to help clothe and equip the armies with which we are co-operating in Europe, and to keep the looms and manufactories there in raw material; coal to keep the fires going in ships at sea and in the furnaces of hundreds of factories across the sea; steel out of which to make arms and ammunition both here and there; rails for worn-out railways back of the fighting fronts; locomotives and rolling stock to take the place of those every day going to pieces; mules, horses, cattle for labor and for military service; everything with which the people of England and France and Italy and Russia have usually supplied themselves but cannot now afford the men, the materials, or the machinery to make.

It is evident to every thinking man that our industries, on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches. The industrial forces of the country, men and women alike, will be a great national, a great international, Service Army,—a notable and honored host engaged in the service of the nation and the world, the efficient friends and saviors of free men everywhere. Thousands, nay, hundreds of thousands, of men otherwise liable to military service will of right and of necessity be excused from that service and assigned to the fundamental, sustaining work of the fields and factories and mines, and they will be as much part of the great patriotic forces of the nation as the men under fire.

I take the liberty, therefore, of addressing this word to the farmers of the country and to all who work on the farms: The supreme need of our own nation and of the nations with which we are co-operating is an abundance of supplies, and especially of foodstuffs. The importance of an adequate food supply, especially for the present year, is superlative. Without abundant food, alike for the armies and the peoples now at war, the whole great enterprise upon which we have embarked will break down and fail. The world's food reserves are low. Not only during the present emergency but for some time after peace shall have come both our own people and a large proportion of the people of Europe must rely upon the harvests in America. Upon the farmers of this country, therefore, in large measure, rests the fate of the war and the fate of the nations. May the nation not count upon them to omit no step that will increase the production of their land or that will bring about the most effectual co-operation in the sale and distribution of their products? The

time is short. It is of the most imperative importance that everything possible be done and done immediately to make sure of large harvests. I call upon young men and old alike and upon the able-bodied boys of the land to accept and act upon this duty,—to turn in hosts to the farms and make certain that no pains and no labor is lacking in this great matter.

I particularly appeal to the farmers of the South to plant abundant foodstuffs as well as cotton. They can show their patriotism in no better or more convincing way than by resisting the great temptation of the present price of cotton and helping, helping upon a great scale, to feed the nation and the peoples everywhere who are fighting for their liberties and for our own. The variety of their crops will be the visible measure of their comprehension of their national duty.

The government of the United States and the governments of the several states stand ready to co-operate. They will do everything possible to assist farmers in securing an adequate supply of seed, an adequate force of laborers when they are most needed, at harvest time, and the means of expediting shipments of fertilizers and farm machinery, as well as of the crops themselves when harvested. The course of trade shall be as unhampered as it is possible to make it and there shall be no unwarranted manipulation of the nation's food supply by those who handle it on its way to the consumer. This is our opportunity to demonstrate the efficiency of a great democracy and we shall not fall short of it!

This let me say to the middlemen of every sort, whether they are handling our foodstuffs or our raw materials of manufacture or the products of our mills and factories: The eyes of the country will be especially upon you. This is your opportunity for signal service, efficient and disinterested. The country expects you, as it expects all others, to forgo unusual profits, to organize and expedite shipments of supplies of every kind, but especially of food, with an eye to the service you are rendering and in the spirit of those who enlist in the ranks, for their people, not for themselves. I shall confidently expect you to deserve and win the confidence of people of every sort and station.

To the men who run the railways of the country, whether they be managers or operative employees, let me say that the railways are the arteries of the nation's life and that upon them rest the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power. To the merchant let me suggest the motto, "Small profits and quick service"; and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas no matter how many ships are sent to the bottom. The places of those that go down must be supplied and supplied at once. To the miner let me say that he stands where the farmer does: the work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great Service Army. The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employees that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

Let me suggest, also, that everyone who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations; and that every housewife who practices strict economy puts herself in the ranks of those who serve the nation. This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditure as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring.

In the hope that this statement of the needs of the nation and of the world in this hour of supreme crisis may stimulate those to whom it comes and to remind all who need reminder of the solemn duties of a time such as the world has never seen before, I beg that all editors and publishers everywhere will give as prominent publication and as wide circulation as possible to this appeal. I venture to suggest, also, to all advertising agencies that they would perhaps render a very substantial and timely service to the country if they would give it widespread repetition. And I hope that clergymen will not think the theme of it an unworthy or inappropriate subject of comment and homily from their pulpits.

The supreme test of the nation has come. We must all speak, act and serve together!

WOODROW WILSON.

The Commercial Apple Crop of the United States

By J. Clifford Folger, Assistant Fruit Crop Specialist, Bureau of Crop Estimates, Washington, D. C.

THE growing importance of the commercial fruit industry in the United States, the development of highly-specialized districts devoted to the production of fruit crops, and the distribution of these crops into extended markets, all emphasize the need for a more careful study of the so-called commercial production, with a view to a more complete forecast of the probable quantities of different fruits which will be placed on the market in any given year.

Commercial fruitgrowers are interested in knowing the probable production of marketable fruit, in order that they may dispose of their own crops to the best advantage. Buyers are no less interested in reliable forecasts in order that they may approximate more closely what the market will permit them to pay. Misinformation supplied from biased sources cannot prove profitable to either. For example, in a year when the commercial crop is underestimated, buyers might pay more than the market justified, but as a result in the following year they would quite naturally be over-cautious, their margins increasing or decreasing with the risk involved. In other words, reliable forecasts on commercial fruit production will tend to limit speculation and to stabilize the industry.

Many growers are inclined to place the commercial production paramount and discount the remainder of the crop. However, the total agricultural production is of general interest and must of necessity be the basis for all fruit estimates. In considering the apple crop, and this is the most important fruit crop from a commercial standpoint, we find that in the total agricultural production, there are certain well-defined lines of cleavage. The first line of demarkation separates the apples actually sold by the farmer from those consumed or left on the farm. In the apples sold there is a further line of distinction between those which are to go for fresh fruit consumption and those which are to be used for drying or in the manufacture of cider, vinegar or other by-products. In reality, then, it is the part of the commercial apple crop which goes into commercial channels for consumption as fresh fruit that so vitally interests the apple growers. This portion of the apple crop might be divided further into that part which is placed on the market in standard packages, such as barrels or boxes, and that part which is marketed in bulk or otherwise.

Specifically, forecasts will be of greater value to the individual as they succeed in more closely analyzing the total agricultural production along certain lines of natural cleavage, these forecasts limited, of course, by accuracy and practical difficulties of obtaining them. Estimates to include the probable production of the different leading varieties of apples in any state, or better, in any given district, would

furnish the grower of any particular variety of apples more detailed information of the crop prospects in certain specific competing districts.

Recognizing the great importance which the fruitgrowers attach to a forecast of the commercial fruit crop as outlined above, and realizing the benefits to be derived from a more detailed analysis of the total agricultural production, the Bureau of Crop Estimates in the United States Department of Agriculture has already taken important steps in this direction in past reports, and now proposes to go further in its collection and dissemination of fruit-crop estimates. It is manifest, however, that hastily constructed or imperfect plans could result only in failure, and that only with the co-operation of fruitgrowers, dealers, and those interested in the fruit industry generally can the best results be obtained. An idea of the importance of the undertaking may be had from the fact that the total annual production of fruits is valued at more than \$300,000,000. Of this amount the apple crop contributes more than any other single crop. For this reason the Bureau of Crop Estimates will confine its efforts at first to perfecting a system for estimating the apple crop. Later, attention is to be directed to improving the present estimates of other fruits.

A brief consideration of some of the characteristics of the apple industry as a whole is important in its bearing upon crop estimates. In specialized areas such as those in the Pacific Northwest a very high percentage of the total production is commercial, while in other sections having a large agricultural production a very small percentage of the crop is sent into commercial channels in an average year. Yet unusually light or unusually heavy crops in parts of the country may cause such districts to direct a very appreciable percentage of their production into commercial channels. Important changes in total production may be caused by young orchards coming into bearing, or by a decrease in the number of bearing trees. In some districts summer varieties are an important part of the commercial crop, in others they are negligible. There is also a wide fluctuation in the yield of fruit trees one year with another. The biennial habit of bearing of many varieties of apples, frost damage and other influences explain the irregularity in local yield which is more pronounced than in many other crops.

Thus many difficulties attend the work of perfecting a method of statistical inquiry regarding the commercial apple crop. While it is not within the province of this article to discuss methods of statistical inquiry, still the general methods of securing crop forecasts are of interest to many. At the outset an actual enumeration of the number of barrels of apples being produced on

all of the apple trees in the United States in any given year would be both impractical and unreliable, and yet the approximate size of the crop in barrels may be determined by other methods. These methods may be characterized as based upon comparison and a comparison for any given area can best be drawn by the growers themselves, or by those who have been in intimate touch with the crops of this area over a period of several years. The best judgment of a large number of those who are in closest touch with crop conditions may be interpreted into definite figures by a comparison with accurate estimates of previous years. To this end the Crop Estimates Bureau for many years has used lists of several thousand apple growers and others closely allied with the apple industry who are called upon from time to time to furnish reliable information on representative areas in all parts of the country. These lists, of course, are constantly changing and being augmented, and the inauguration of the extended apple estimating service will necessitate a liberal extension of an already large list.

For the total agricultural production of apples as well as all other crops, a complete system of forecasting has been perfected which includes reports from every township of agricultural importance in the United States. In the past the estimates for the agricultural production of apples have been secured from four separate and distinct sources, each more or less complete and acting as a check upon the other three. They are as follows: (1) The above-mentioned list of several thousand apple growers who have been furnishing periodic information in response to inquiries relating solely to the apple crop. (2) A voluntary crop reporter in each township who reports monthly to the Bureau on the crops of his neighborhood. (3) A voluntary reporter in each county who also reports monthly for the entire county, basing his reports upon personal observation, interviews, and upon reports from farmers and others, in different parts of the county. (4) A salaried field agent in each state who spends most of his time, during the growing season, traveling over his respective territory and keeping in intimate touch with crop conditions. Each state agent maintains a list of several hundred well-informed men who report to him monthly. It may be seen that the above machinery, which has developed from many years' work in the collection of estimates, is by far the most reliable and impartial means of collecting crop statistics and has furnished the basis for estimating agricultural production, including all fruits and the more specific forecasts on the apple crop. However, this general system of crop reporting is designed more particularly for field crops, grown generally throughout an entire state or

number of states. Commercial fruit crops are highly specialized and their cultivation is concentrated in particular regions. For this reason they do not lend themselves as readily to a general system of crop reporting. Recognizing this fact, the Bureau of Crop Estimates has added to its working force two fruit-crop specialists who will give their entire attention to perfecting a system for estimating the commercial apple crop. Once perfected, this system can be extended to include other fruits.

The fruit specialists will visit important districts and confer with apple growers, dealers, growers' and shippers' organizations, and others interested in the apple industry. Support and co-operation will be enlisted in the

work of making reliable forecasts from month to month on the size of the crop and in collecting information on the general conditions throughout the country during the growing season. By this plan it will be possible to carry to those interested in apple yields information regarding not only the entire crop as a whole but also regarding the crop of a particular state or district. It is obvious that such information can scarcely be collected by individuals or by local organizations since it must be impartial and broad in its scope.

The plan in a general way is to have the apple specialists, who are familiar with the industry in different parts of the country, visit periodically the most important apple districts, personally inspecting the growing crops and col-

lecting data on the acreage of trees both bearing and non-bearing. Information is to be secured on the importance of certain varieties, the proportion of the crop sold for fresh-fruit consumption, and whether shipped in barrels, in boxes or in bulk. Co-operative relations are to be established with individual growers and organizations in order that the most complete data may be collected. Large lists of reporters in intimate touch with the industry in all its phases are to be maintained and these aids will report systematically during the growing season. In short, by gradual development it will be possible to work up a uniform system of estimating, which will render the greatest service to the commercial fruit industry.

"Keep Your Eye On the Ball"

By J. F. Sugrue, Cashmere, Washington, at Washington State Horticultural Meeting, North Yakima, January 4, 1917

IN a spirit of optimism, and perchance in a moment of temerity, I allowed your worthy president, Mr. Howard Wright, to induce me to submit a paper for your approval at this our annual meeting. The title chosen was "Keep Your Eye on the Ball." I was induced to choose this title because it sounded euphonious and rolled easily and unctuously off the tongue. Another reason was that in my youthful days I was a fervent devotee of the noble game of football. In Ireland, where I was born, football flourishes in more forms than in most other countries. Over there we play three codes of rules, Rugby, Association and Gaelic. As described by an enthusiast the laws are as follows: In Rugby you kick the ball. In Association you kick the man if you cannot kick the ball, while in Gaelic you kick the ball if you cannot kick the man,—so you see in all three games the ball is an object.

Now let us see where the title of this article can be applied to the fruit game. As in football the ball is of prime importance, so in fruit raising the fruit needs some consideration. Horticulture, the science of raising and caring for trees, is not remunerative unless the product or crop of those trees is marketed in such condition as to be marketable at a profit. Much as I dislike to be statistical, I am going to ask your indulgence and introduce a few figures for your consideration. When we engage in any mercantile or manufacturing business, one of the first essentials is to pick out and take notice of the inevitable investment, the overhead expense and the cost of production. Let's do that in our case.

An orchard in full bearing will mean an investment of from \$500 to \$700 per acre. In many cases we know, to our sorrow, that it means a good deal more than this sum. The average yield of a well-grown and carefully tended orchard may be put at 500 boxes per acre per annum. With money at 8 per cent this shows an overhead expense of 12 cents per box. To convey our fruit to market we have to meet a freight charge of, say, 50 cents per box.

Owing to the fact that our orchard investments have been made and are situated at a great distance from the heavily populated consuming districts; this expense is unavoidable and may, indeed must be figured as constant. We now have 50 cents plus 12 cents, which equals 62 cents per box, or \$1.86 per barrel. To raise a box of apples and to estimate the exact cost is not easy, but it will run close to 10 cents per box; 50 cents plus 12 cents plus 10 cents equals 72 cents per box, or \$2.16 per barrel. We now are confronted by the fact that apples will not harvest themselves, and I am going to arbitrarily fix the cost of this operation at 32½ per box; 50 cents plus 12 cents plus 10 cents plus 32½ cents equals \$1.04½ per box, or \$3.43½ per barrel. To all these costs we must still add warehousing, selling, insurance and storage. I don't know just what your ideas on these costs are, so I am going to lump them at 14½ cents, making a grand total of 50 cents plus 12 cents plus 10 cents plus 32½ cents plus 14½ cents, or \$1.19 per box, \$3.57 per barrel, delivered at the other end of the line. We also know, or should know, that our Eastern competitors, who raise apples in greater quantities than we do, can raise, harvest and land in the same centers apples, by the barrel, at from \$1.10 to \$1.50 per barrel. There can be no doubt that we are faced with some very unmistakable handicaps, and that vigilance and the most rigid suppression of waste is absolutely necessary on our part. In short, to be successful in this business, ability of a higher order is necessary.

We have, to offset this state of affairs, some natural advantages, and it is imperative that we utilize them to the utmost. Here is where the direct application of the title may come in and by substituting the word "fruit" for "ball" we will proceed to illustrate. "Keep Your Eye on the Fruit." We have in the past and can, in the present and future, raise an apple in this Northwest that for flavor, color and keeping quality cannot be surpassed. Are we doing it to the utmost of our ability or

are we lying on our oars and living on our past reputation? I am a little uncertain on this point.

Is it or is it not a fact that the percentage of high-grade fruit is falling off, and if it is so, who is to blame? Us or the weather? Is our pruning done as thoroughly as it might be? Is our spraying done as efficiently as possible? Do we cultivate, irrigate, thin, and prop with the same enthusiasm as when the game was new and attractive? I'm afraid we don't. Have we decreased the percentage of undesirable varieties in our orchards to the extent that experience has taught us is necessary, or are we still laboring under the delusion that any old apple will do? Have we fully and finally realized that it is our business to produce at the minimum cost an article of maximum excellence? And that the most efficient form of co-operation we can practice toward our selling agent, no matter who it may be, is that of strengthening his hand by instructing to him an article that he, in turn, can show without fear of criticism or complaint from the buyer? Have we? Are we upholding the standard of our grades, or are we admitting that as raisers of high-grade fruit we are a failure? I am asking quite a lot of questions, but remember I am here just as much to secure information as to give it. The purpose of my article here, today, is to induce a close analysis of our condition and if possible to rub our heads together and secure satisfactory enlightenment on a subject that I, and, indeed, all of us are deeply interested. In answering these questions, or at least some of them, I am giving you just the result of my own personal observations. I am drawing my conclusions not alone from my own personal experience, but from observation of orchards scattered up and down the Wenatchee Valley.

Taking the questions in bulk, as it were, I would say, "We have not." We are not engaging in horticulture as carefully or as efficiently as the occasion requires. Take spraying. My own experience is that not one man in ten



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handles a spray pole properly. The calyx spray means the implanting of a drop, or two drops, of poison liquid in the calyx cup of the blossom. To do this necessitates more than a spraying machine—more than 200 pounds pressure—more than 15 per cent poison in the arsenate of lead—it needs an artist on the spray pole. Artists are not easily found, therefore the only remedy is for the owner or a reliable foreman to closely scrutinize the process of spraying. To implant a drop of liquid in the small aperture available with your head looking over your shoulder, so as to fluently and easily converse with your neighbor, who in turn is doing the same thing, is a very difficult feat to perform. Yet I see them attempt it in droves every spring. Spraying for the calyx means keeping your eye on the fruit. Keeping it anywhere else won't do.

Take irrigating. When we first bought or had wished on us our orchard property, it was a task of joy, a labor of love, to put our hoe or shovel over our shoulder and set out in the cool morning, turning on the taps, or rather opening those dear old wooden buttons and letting the water trickle through the tree rows. It was just one gigantic game of "mud pies," like the children on the sea beach with their little spades and buckets, building sand castles, you know. We went at our work with vim and glee. When we saw an elderly neighbor attempting to make a stream of water run up hill, we would join him and help, and enjoy it. We were not satisfied to turn the water on at the top of the row, we would follow it down to the other end, plugging up worm holes and gopher holes and leading streams of water here and there, seeing to it that every tree got a drink when it needed it.

Those were days of real sport. Do we still do it? I fear not. Now, instead of giving the trees a drink when they need it, we give it to them when we feel ready to do so. That's not good. Trees are not like some friends of mine, who want a drink all the time. Trees starve when they go dry and get waterlogged when you over-soak them. Again, I say, "Keep Your Eye on the Fruit."

Thinning. There never was a period in this business when we thinned enough, but I really believe we have made more satisfactory progress in this particular than in any other. Still it is hard to make some of us believe that a thorough thinning means more high-grade apples, more regular crops, more desirable sizes and practically the same tonnage year after year. Don't overlook the thinning, and when you keep your eye on the fruit, in this instance, keep it on the fruit on the tree. Don't mind the fruit on the ground. I've heard a good deal about worm stings this year. Poor thinning is great for worm stings. When your tree is overloaded and two apples are hanging on one spur and you come around with your second and third spray, how do you hope to thoroughly cover your apples with poison? Believe me, if we'll all prune, thin and prop more carefully we'll find worm stings decrease rapidly.

Do I hear anyone say stem punctures? Maybe it was my imagination. A few years ago, if a man picked 60 to 75 boxes a day, at harvest time, it was considered a good day's work. Today I hear growers tell about the man who picks 100 to 150 boxes a day. What's the result? A few years ago, when picking was going on in an orchard and you wanted to find where the crew were working, you put your hands to

your mouth and you holloed, "Hey, there!" A voice would answer you out of the stillness, and lo and behold, your picking crew was discovered. Today you can come out on your porch, just place your hand behind your ear and instantly point out the direction in which your crew is. It may be a mile or only one-half a mile, but anyone can tell by the rattle and the hanging of the apples in the bucket or the box where the industry is going on. It sounds like a grouse drumming in the woods. The grower sits back and says, "They can't fool me. I know when they are loafing. If I can't hear them I just go out and jack them up." That's where you get your stem punctures. I remember reading in early days how they picked apples in Hood River. They picked them into buckets full of water. I wonder if they do it now. I know they don't up where I come from.

Isn't it a fact that we are beginning to realize that we must confine ourselves to a few varieties that, first, are suitable to the district and, second, are in favor with the consuming public? I think we are. Are we taking sufficiently rapid steps to bring this condition about? I will not attempt an answer on this point. I realize fully the difficulty experienced by individual growers in making up their minds to cut down full-grown trees that at one time were a source of income but are now, in too many instances, a source of expense. However, until that is done we

Continued on page 30



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Washington's New Office of Markets

State Agricultural Experiment Station, Pullman, Washington

PROFITABLE marketing of his produce is one of the most serious problems confronting the American farmer today. In the Northwest this problem is especially difficult owing to the long distance between larger centers of population and regions of production. The State of Washington ranks high in the quality and quantity of its agricultural products, and if adequate markets are available the agricultural prosperity of the state is assured. Mindful of this situation, the 1917 Legislature wisely passed an act creating a state office of farm markets providing for a director of markets and assistants who shall give their time to the investigation, encouragement, development and improvement of marketing conditions in the state. The bill was formulated and introduced by Senator Ralph Metcalf of Tacoma, one of the foremost students of agricultural economics in the West today. Senator Metcalf was

one of Washington's representatives on the National Commission on Rural Credit and Co-operative Organization sent to Europe four years ago and he has, during the past two years, made a careful study of marketing departments in the various states of this country, embodying the results of this work in the law recently passed.

The law provides for an investigation of methods of distribution, transportation rates, methods of reducing wastes, costs of marketing, and is designed to assist in every way possible in the improvement of marketing conditions. The maintenance of a market news service is provided for, as is also co-operation with the Office of Markets, U. S. Department of Agriculture, thus bringing to the assistance of the people of the state the full power of the federal and state governments in coping with this important problem.

The law provides for a director of

farm marketing appointed by the Director of the State Experiment Station, by and with the approval of the governor. It will, therefore, devolve upon Dr. Ira D. Cardiff, Director of the Experiment Station, to organize the new office of markets and supervise its work. The affiliation of this new office with the Experiment Station will have the result of closely co-ordinating the problems of agricultural production with those of distribution and marketing.

The act carries an appropriation of \$15,000 for the biennium, which, while small as compared to such appropriations in other states, nevertheless will allow the state to make a beginning in this line and effectively co-operate with the federal marketing departments and also local marketing organizations. The act is a piece of wise and constructive legislation which will doubtless have far-reaching consequences in the economic development of the state.

Soil Bacteria Needed in Growing Legumes

Oregon farmers having trouble in getting their alfalfa or other legumes to grow are entitled to receive cultures of soil inoculation bacteria at a nominal charge by writing to the Bacteriology Department of the Agricultural College, Corvallis. The cost is 40 cents for cultures for two acres or less, and 60 cents for enough to inoculate from two to fifteen acres. The price includes postage and also full directions for applying the cultures. One week's notice in advance is required in filling orders, especially in the busy seasons. Successful growth of the legumes is impossible without the presence of these organisms, says Professor Beckwith. It is possible to grow them in greater or less degree without bacteria, but not profitably. They will not build up the soil nor produce as they should. If the bacteria are naturally in the soil, no more may be needed. If they are not, they must be supplied by inoculation. These inoculations are advisable for the legumes under the following conditions: If no legumes have been grown within four or five years on the soil to be planted; if no legumes of any kind have grown on the soil at any time. If farmers entertain any doubts as to the need for inoculation they may find it profitable to inoculate experimental plots and check up with the remainder of the field.—Oregon Agricultural College Bulletin.

Read the "Happy Apple Shipper," page 20.—Advt.

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Hudson Super-Six



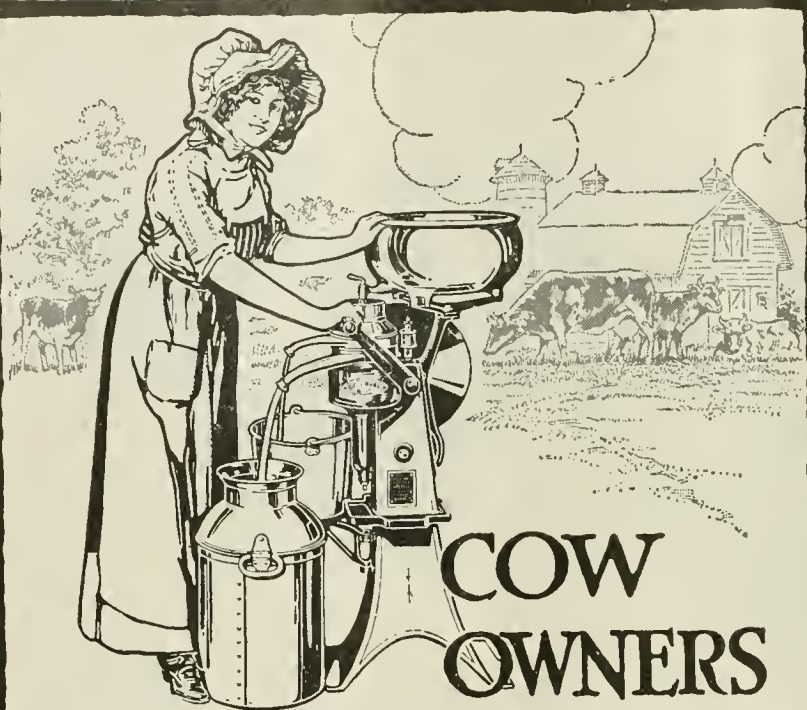
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The mildew confines its attacks in the main to young shoots and blossom clusters. Both stem and leaves of shoots may be affected and either killed, deformed or reduced in size and vigor. Blossom clusters may be blighted and young fruits may be affected later than at the blossoming period. The mildew is known on the fruits of the pear also. The amount of blighting of blossoms varies in different localities. Secondary infections may occur on mature leaves to a limited extent.

The control of the disease calls for the employment of two methods, (1) pruning and (2) application of fungicides. In light attacks of mildew it seems probable that pruning alone will suffice, while in orchards where the disease has gained considerable headway spraying must be resorted to in addition to the pruning.

1. Pruning. It is known that infested buds on badly mildewed shoots produce seriously diseased shoots the following spring. Spraying will not prevent these infections, so the affected shoots should be removed and destroyed by burning. This may be done at any time consistent with horticultural practice and if not done earlier should be made a part of the regular dormant pruning operations. If mildew is serious it will be advisable to prune out more brush than ordinary to stimulate the growth the following season. In general, the pruning practice should aim to eliminate close interlacing of branches and vigorous shoots of the current year's growth should be cut back one-third to one-half.

2. Spraying. The time of application of the spray may be given first consideration. It has been demonstrated that winter spraying is without effect on mildew in California. It has not yet been determined whether this holds for Washington conditions or not, but it is probable that such will be the case. The times of spraying to be recommended are as follows: (1) Just after the petals fall. (2) In connection with the second spraying for codling moth or earlier if the mildew is serious. (3) Three or four weeks after the second spraying. It may be necessary to spray a fourth time after a like interval if mildew is serious and conditions continue favorable.

The selection of the fungicide is a matter of considerable importance and should depend in part at least upon what other diseases are present in an orchard. In some sections of Washington powdery mildew is the only fungous disease of the apple that is present, which in others the orchard must be protected from scab also. In case scab is present the regular lime-sulphur treatment (1-30) for this disease should prove of value in the control of mildew. The number of sprayings for scab will vary according to conditions and the severity of the disease. Those most generally recommended are as follows: (1) Just as the blossom buds separate and show pink. (2) Just after the petals fall. (3) Ten days to two weeks later. Experience will show whether the first

Powdery Mildew of Apple

The powdery mildew of apple is due to the parasitic fungus, *Podosphaera leucotricha*, the vegetative body or mycelium of which develops as a coating of minute interlacing whitish filaments on the parts of the plants attacked. The fungus produces two spore stages in its life history: the conidial or summer spores, which are produced throughout the growing season and give to affected parts a whitish, powdery appearance; the ascigerous stage, which

gives rise to the ascospores. The latter is produced only upon the twigs, and the bodies bearing the ascospores may be found buried in the dark felted mycelial mass towards the end of the growing season. The conidia serve to spread the fungus during the growing season. It is apparent that the fungus is carried over the winter by mycelium which hibernates in the buds and also by the ascospores. The part which the latter play in the life history of the fungus is somewhat problematical.

only, or all of these applications are necessary. If the mildew is bad additional sprayings may be necessary for this disease alone, and in this case it may be advisable to employ one of the sulphur sprays recommended below. If powdery mildew is the only disease for which protection is sought one of the following fungicides may be used:

1. Atomic sulphur or some other finely divided form of sulphur. Atomic sulphur may be used at the rate of 2-6 pounds to each fifty gallons of water. It seems probable that the minimum strength recommended will give as

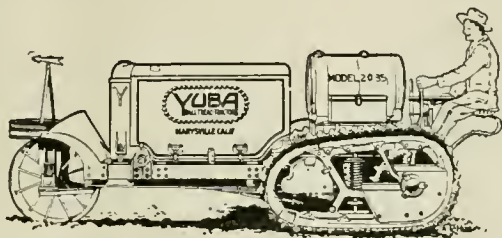
effective protection as the more concentrated solutions.

2. The iron-sulphide mixture. (See U. S. Department of Agriculture Bulletin 120, 15-16, for original method of preparation.) The rather laborious method described in the reference given does not seem to be necessary, at least for the drier sections of Washington. The modified Ballard formula is as follows: Iron sulphate (copperas), 4 pounds; lime-sulphur, 33 deg. Beaume, 1 gallon; water, 200 gallons. A stock solution of the iron sulphate should be made and one pound to the gallon in a

convenient strength. Fill the sprayer tank, start the agitator, add the lime-sulphur and slowly add the requisite amount of iron sulphate solution. In order to insure complete precipitation of the iron sulphide a slight excess of lime-sulphur may be used. The necessary insecticides like Blackleaf 40 or lead arsenate may be added to either the atomic sulphur or the iron sulphide mixture.—Bulletin 154, Experiment Station, Pullman, Washington.

Read the "Happy Apple Shipper," page 20.—Advt.

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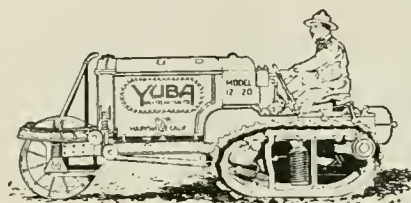
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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Wilmer Sieg.—Mr. Wilmer Sieg, who has been sales manager for the Hood River Apple Growers' Union and its successor, the Hood River Apple Growers' Association, from 1912 to 1917, tendered his resignation to take effect May 1st, to accept a position with the Earl Fruit Company, one of the oldest, strongest and largest of the selling organizations in California. Owing to the large business which they have been doing in the Northwest, the Earl Fruit Company incorporated a separate company to look after Northwestern business. At the time when Mr. Sieg took the position as sales manager of the Hood River Apple Growers' Union in 1912 the condition of the Union was critical. The Valley was fraught with strife, due largely to factional contention, and as a result the Valley became split, more self-competition prevailing than ever before. The Union was impaired in strength, which made Mr. Sieg's beginning a most difficult one indeed. Yet out of that chaotic condition he has been a factor in building one of the strongest and largest Associations in the Northwest. Mr. Sieg's accomplishment and success is due to his ability, to his loyalty and to hard work. No man ever worked more faithfully or harder than Mr. Sieg, nor more devotedly. During the busy season he could be found at his office every holiday, every Sunday and every night. Those who knew him best—those who were most intimately associated with him in connection with the work, appreciate his work to the fullest extent. But in addition to this it may be said there is a general feeling of regret over his resignation, and perhaps no man feels his departure more keenly than Mr. Sieg himself. However, on account of the very attractive position offered it is well understood that in justice to himself he could not decline. The success of any selling organization depends principally upon the net returns paid

to the grower. The Apple Growers' Association has received significant prices for apples compared with any other district in the world during the last few years, and in as much as the selling end of the business was managed and controlled by Mr. Sieg it goes without saying that he has achieved success. While success in business speaks much for a man, especially in the commercial world, there is much outside of business that is equally if not more significant than success in business. Mr. Sieg has accomplished much in addition to his success as a salesman, while a resident of this Valley, and perhaps the greatest compliment after all that could be paid him would be to say he has been known and regarded as a most faithful worker, as a man absolutely loyal to the Association, as a man noted for his generosity, for his kindness and for his liberality.

The Fruit Growers' Agency.—The United States Government knows that the prosperity of the country depends upon the prosperity and success of the farmer. The success of the farmer and fruit grower depends upon his being able to market his product in an economical way at the true market value. Every farmer and fruit grower knows that in the past he has not been able to do this to the fullest extent. The United States Government desires to co-operate with the fruit growers and farmers in helping them solve the problem in marketing in the most economical way and at the same time obtain true market values for their product. The Bureau of Markets have agreed to furnish the Fruit Growers' Agency with all the marketing information obtained through their many representatives pertaining to the fruit industry of the Northwest. In 1916 the Fruit Growers' Agency was incorporated. The first year, as a matter of fact, it could not be expected to be very much more than an experiment. The experiment has been made. Those connected with the Fruit Growers' Agency feel that the way is clear now for them to render an efficient and valuable service to the fruit growing industry of the Northwest. The Government is fully convinced, consequently the Fruit Growers' Agency stands ready to co-operate with the fruit grower, to help the fruit grower, providing the fruit growers will support the Agency. Therefore, in the year 1917 the Fruit Growers' Agency for the first time is really prepared to render a service of value founded on experience, consequently every fruit grower and every shipping concern should support the Agency. Every fruit grower and every shipping concern who wants better prices, who wants to market more economically, who does not feel satisfied with the past has no excuse for not helping the Fruit Growers' Agency, except the matter of expense, which is nominal, as the same will probably not exceed 50 cents per car for the year 1917. The official representatives of the different shipping concerns affiliated with the Fruit Growers' Agency met in Spokane in April. They believe they have reconstructed the Agency and placed it

on a practical basis, making it possible during the year 1917 to render a real service of great value to the fruit grower in marketing his fruit more economically and obtaining the real value. It is with regret, on account of limited space, "Better Fruit" is not able to publish a full report of the aims and objects of the Agency—the changes that have been made and the work of the Agency for 1917, but all these particulars can be obtained by addressing the Fruit Growers' Agency, Walla Walla, Washington.

The War.—The President's address, published in this edition of "Better Fruit," in the view of those most able to pass judgment, is well worth reading, and reading carefully. The causes for war have been a matter of discussion for many weeks and months with everybody, especially with the administration and Congress, who of course, as we all know, are much more fully informed than the average individual citizen. No nation in the world loves peace more devotedly than the United States. Whether the United States could have kept out of the war is a subject that seems useless to discuss at the present moment. The administration and Congress are our chosen representatives. The time for argument is past—"My country, may she ever be right, but my country right or wrong," was probably the most patriotic remark that was ever made. Each one must do his share. The work to be done in the rear is equally important with the work at the front. Every one who does not go to war should do his share in his service and work to make it efficient and productive and in the most economical way. Many will be drawn from the field of endeavor to the army and navy, so those who do not go should make extra effort in the way of productiveness as well as in many other ways too numerous to mention, so that everyone engaged in the army and navy, and everyone at home will be fully supplied in a comfortable way with all the necessities of life, which can only be done properly and economically by everyone doing his share to the fullest extent.

Spraying.—It is unanimously agreed that the profit in growing fruit depends to a large extent upon the high percentage of Extra Fancy and Fancy. This can only be secured by intelligent, thorough and careful spraying with the right materials at the proper time. Those who have not looked into the matter carefully and analyzed their returns, perhaps do not realize how much extra money the high percentage of high grades means on the net returns. The writer had occasion to look over a crop of Newtowns that ran particularly high in grades, and was surprised to find that, although the crop of the district on the average was good for Extra Fancy and Fancy, this particular crop was so good that it netted the grower 12 cents more per box. But it must be admitted that the other fellow's experience is not always quite so good, as you know, therefore the following suggestion: Take this year's

returns on any varieties of apples, figure out what the variety brings you net from the shipping concern for the three grades on the percentages grown. If they are low, or below 50, 30 and 20, just take the figures you have received and figure out how much your crop would have brought you if your crop had been 50 per cent Extra Fancy, 30 per cent Fancy and 20 per cent C grade, and see what the difference would be. The difference will be surprising compared with a crop running 40, 30 and 30, which is grown by many growers, with no small number having poorer percentages than this.

Tying Trees.—Every fruit grower has had experience in propping trees, especially when the crop is very heavy. Propping is usually done late in the summer or early in the fall, which can be supplemented very successfully by tying up, or looping up, with twine, many limbs not large enough to prop, with considerable saving in expense. But growers have found out that at that time of the year, while the work can be done on the exterior of the tree, tying cannot be done in the interior of the tree very conveniently, for in so doing the workman is apt to knock off many apples, consequently quite a few have adopted the method of tying up many of the limbs before they become drooped with the weight of fruit and before the foliage thickens up, for the reason the workman can get into the interior of the tree more comfortably at this time of year, doing the work successfully, and by being careful not to knock off any fruit spurs. Many of the lower limbs, particularly of trees not very old, which are so low they interfere with cultivation, can be tied up at this time of year very successfully, and a crop grown on them, otherwise they would have to be cut off in order to give room for the necessary cultivation in the orchard. An ordinary amount of intelligence and a little practice will teach a man how to do this work very successfully at this season of the year. A visit to some of the neighbor's orchards who have done this work will be found very helpful to the growers.

Mr. Wm. McMurray, General Passenger Agent, Portland, Oregon, for the Union Pacific System, is to be commended for the excellent work he is doing in issuing from the passenger department a very attractive bulletin or folder, descriptive and beautifully illustrative of the scenery of the Northwest, the illustrations featuring some of the finest scenery in Oregon, Washington and Idaho. The bulletin bears the title, "The National Educational Association," being issued for the purpose of interesting everybody in attending the National Educational Association to be held in Portland, Oregon, July 7-14. The opportunities in the Northwest are splendid—the scenery unsurpassed, the climate almost perfect the year round. The Northwest needs people. No method can be more effective in bringing people to the Northwest so they can understand the value of the Northwest

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than good conventions, which of course must be given wide publicity and advertised to create an interest in attendance.

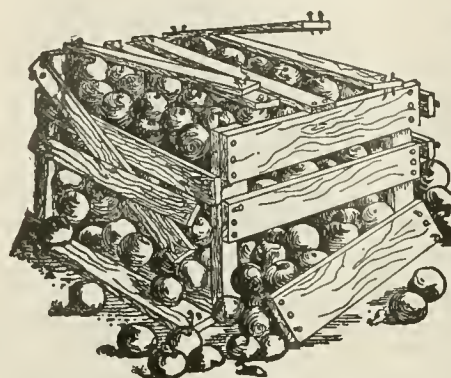
Get Ready.—The spraying season is near at hand. Every fruit grower should be equipped with a first-class spray rig. If he does not already own one he should buy one. It is mighty good judgment to take time by the forelock and in advance of the rush of the spraying season go over your spray rig carefully, clean it thoroughly, for the purpose of seeing that it is in perfect working condition. Such work done in advance frequently means a saving of much valuable time at the period when a delay in spraying is costly.

Spray Hose.—In 1916, probably on account of the shipments of rubber to the countries at war, many of the reliable companies ran short of material, consequently the fruit grower was compelled to take whatever he could get in the way of hose for spraying. The editor speaks with feeling on this subject, having had to buy several leads of hose of unknown make, the quality being so poor that frequently some of them would last but for a short time. It seems wise to advise the fruit grower to be particular in the selection of his

hose, being sure to get some brand that is absolutely reliable, some hose that is known to have sufficient strength and durability to stand the high pressure that is necessary to spray successfully.

The Pacific Coast Association of Nurserymen will hold its annual convention at Tacoma, Washington, July 11-13. The editor has attended a number of these conventions in past years and feels justified in saying they are of vital interest and value, especially to the nurserymen of the Pacific Coast, and also feels justified in saying that it is the duty of every nurseryman on the Pacific Coast to attend the convention at Tacoma. Full particulars can be obtained by addressing Mr. C. A. Tonneson, secretary of the Pacific Coast Nurserymen's Association, Tacoma, Washington.

"Strawberry Growing," by S. W. Fletcher, Professor of Horticulture at the Pennsylvania State College, published by McMillan & Company, is the title of a recent publication, containing much valuable and instructive information about every feature of growing, tillage, planting and harvesting the strawberry.



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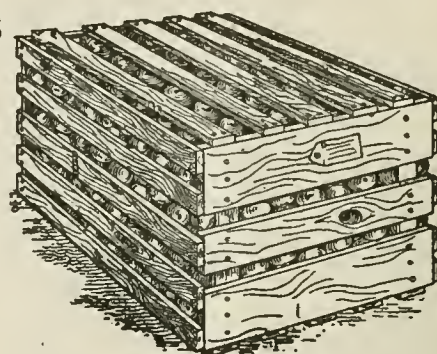
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Apple and Other Fruits In the Argentine Republic

By Robert N. Justo, of the Argentine Republic, a student of the Oregon Agricultural College, Department of Horticulture, under Prof. C. I. Lewis

BUENOS AIRES, the metropolis of southernmost of South American Republics, is a seaport, a river town and the nucleus and terminus of many great railroad systems making a giant spider web on the map of the surrounding territory; it is an excellent collecting and distributing center, and its markets are a ready index to the capacity of the country with which it communicates. From the fertile oasis-like province of Tucuman there drift in at nearly all times of the year small quantities of tropical fruits such as avocados, pineapples and chirimoyas. Boatloads of oranges of varying qualities come down from Paraguay, and

they are undoubtedly the cheapest and most plentiful fruits at all times of the year. The true navel orange is brought at times from its original home, Bahia, on the coast of Brazil, by steamers en route from North America or Europe. In the same manner the banana is brought by vessels touching at the great coffee port of Santos in Southern Brazil, where it is grown in the immediate vicinity of the city. Lemons come mostly from Italy, while Spain sends both lemons and oranges. One tropical or sub-tropical fruit now so common in this country, the grapefruit or pomelo, is entirely unknown. The earlier varieties of temperate fruits come from the Banda Oriental, the eastern shore or Republica Oriental, as Uruguay is generally known in Argentina. This is especially true of the strawberry, which is less grown on the western side of the Plata, and of which the few seen in the market are high priced and of poor or medium quality. The bush fruits do not thrive in the warm climate of that region and are all practically unknown. During the summer months the gardens and farms of the vicinity of the capital and of the numerous country towns within a radius of seventy-five miles contribute handsomely to the fruit supply of the market. Peaches, apricots, plums, nectarines, cherries, figs, loquats, medlars, pears, quinces and apples make up the list that comes from that neighborhood. The islands of the lower Parana, one of the greatest rivers that go to form the Plata, near the populous summer resort of the Tigre, constitute the richest fruit-growing region near the City of Buenos Aires. Mendoza, situated 800 miles inland at the base of the Andes, constitutes another big factor in supplying markets of the capital. Among imported temperate fruits one sees in season beautiful specimens of Angouleme pears from France, or summer apples from both France and Portugal, grapes and boxed Mazzard cherries from the Iberian peninsula, and apples from Uruguay, Chile, New Zealand and last, but not least important, both apples and pears from the United States.

Grapes and peaches are the cheapest and most plentiful of the Argentine-grown fruits. Better table grapes of the vinifera varieties can be bought in Buenos Aires than are to be found in the cities of Eastern United States. They are all shipped from the rich irrigated wine-producing region of Mendoza. The best varieties retail at about seven cents per pound in Buenos Aires, but are nearly given away in their place of production. They constitute a sort of side line to the wine industry, but still have yielded enormous profits to some growers. The production of wine alone amounts to about one million gallons annually, or about twice that of California or Chile. In this industry enormous sums have been made until very recently, but it is only fair to say to those that might be interested that the industry at the present time is going through a crisis, due principally to overproduction of cheap wines. The prices for grapes delivered at the wine press, posted for the season of 1915, were about one-half to one cent per pound, respectively, for Mendoza and the newer region of Rio Negro in the south. The growing of the Labrusca type of grape of our Eastern States is carried on to some extent also in Eastern Argentina, where the moister climate is not suited for the growing of the "vinifera" varieties, but there also the larger part of the product is employed in the making of wine. The experiment of placing some of the best shipping varieties of table grapes from Mendoza in the markets of New York has been successfully tried. As the seasons in Mendoza and California are the reverse of one another this feat would work both ways, enabling the California grower and commission merchant to ship to Argentina in the same manner as the Spaniards already ship the common Malaga grape to all parts of South America. In the same manner also a better quality of Mazzard cherry could be shipped from our Pacific States than what now comes from Europe. Peaches come from the frost-free lands on the Islands of Parana near Tigre from Mendoza and San Juan and from the many orchards

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PORTLAND, OREGON

E. SHELLEY MORGAN
NORTHWESTERN MANAGER

WE CARRY-AND CAN SHIP IN 24
HOURS-STOCK LABELS FOR PEARS,
APPLES, CHERRIES & STRAWBERRIES.

and gardens existing near the City of Buenos Aires on the cultivated prairie land of the neighboring towns. In both Tigre and Mendoza there are large canneries. The majority of the named varieties of peaches are of European origin, although there are varieties from the United States, especially among the early-ripening kinds. It is in connection with the gathering, packing and picking of peaches that some of the marketing methods in vogue in Argentina can be best observed. Many growers, especially those of Mendoza, do their own gathering and packing, and ship direct to the canneries or commission men, but in the neighborhood of Buenos Aires, the commission men send out agents, who buy up the crops before ripening them, during the season, about January to March, inclusive, send out a foreman, who lives on the place during that time, engages a few peons and attends to all picking, packing and shipping.

The absence of suitable materials for the manufacture of boxes and crates has given rise to the use of peculiar receptacles and packing methods. The basket willow is easily and cheaply grown in the Islands of Parana and other low and moist lands in Eastern Argentina, and packers and shippers are unanimous in proclaiming the wicker basket far superior to any kind of crate. The price of a double basket is about fifty cents and is returned when empty and used again for three or four years. Railroads give reduced rates on fruits, usually half of the rate on general merchandise, or as low as one-fifth of the usual tariff, returning the empty baskets either at the same reduced rate or entirely free.

One fruit largely produced in Argentina of which all South Americans seem very fond, but which naturally is not much found in the market in the fresh state, is the quince. It is remarkable how well it is adapted to the soil and climate; apparently little effort is required to grow it. Especially is that true in the Islands of Tigre, where the quince has evidently found remarkably favorable conditions for growth, having escaped from cultivation in many places, and are able to battle successfully with the native vegetation and yielding large quantities of fruit. It has done the same on the Islands of the lower Rio Negro in the desert country around Viedma, where the roots find plenty of water near the river banks. The favorite and ever-present dessert on all South American tables consists of cheese and a thick, stiff marmalade, both of which are cut and served in the same manner, and usually without the addition of bread and pastry. This marmalade, put up in flat tins of convenient sizes and made from quince, is known in the Spanish-speaking countries as "dulce de membrillo," or sweet of quince, and in Brazil as marmelade, from marmelo, meaning quince, although there the guaiabade, made from guavas, is far more common and popular.

In no part of Latin America has the sale of fresh fruit as an industry attained the development that it has in

For Bigger **SPRAY** Better Crops

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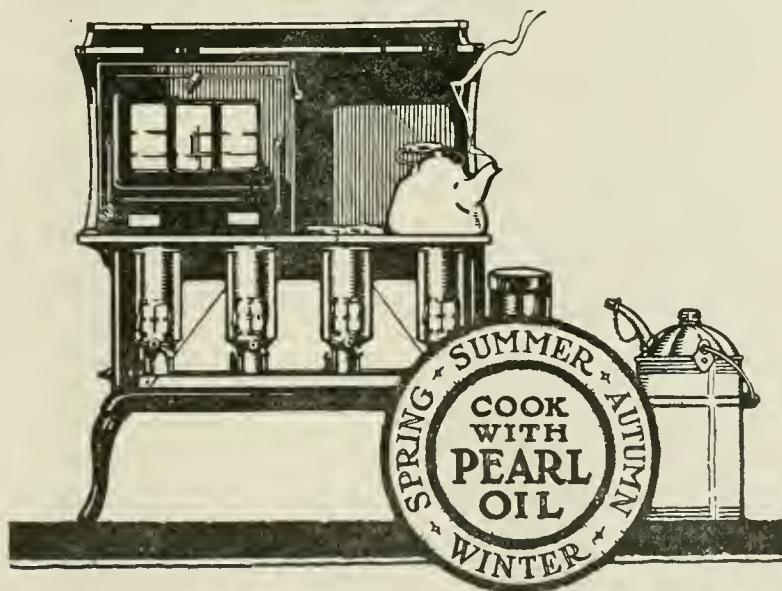
Sherwin-Williams makes the only real Dry Lime-Sulfur on the market. Like other Sherwin-Williams dry powdered insecticides and fungicides, it contains practically no water. Cheap to ship—easy to handle—can't freeze—gives maximum killing power at minimum expense.

Lime-Sulfur	} All in Dry Powdered Form
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Send for our *Spraying Literature*
THE SHERWIN-WILLIAMS Co.

Insecticide and Fungicide Makers
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Cooler cooking in summer—better and more economical cooking all the year 'round.

A good oil stove will cook anything that any wood or coal range will cook, and do it better because of the steady, evenly-distributed heat. All the convenience of gas. Meals in a jiffy, and a cool kitchen in summer.

The long blue chimneys prevent all smoke and smell.

In 1, 2, 3 and 4 burner sizes, with or without ovens. Also cabinet models. Ask your dealer today.

NEW PERFECTION OIL COOK-STOVE

STANDARD OIL COMPANY
(California)

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Spraying Suggestions

In the control of orchard pests during the growing season it is important that all spray materials used be properly balanced chemically, manufactured for a definite purpose, and of the best quality obtainable, in order to give effective control of insects and diseases without injury to the trees, foliage or fruit.

ORCHARD BRAND ARSENATE OF LEAD PASTE, the best known and most extensively used arsenate of lead on the Pacific Coast, is now easy to handle and mix with water, because it is so manufactured as to prevent settling in a hard mass to the bottom of containers, and is a soft, fluffy paste which, after diluting in water, maintains the best possible suspension, which insures an even coating of poison, closely adhering to the surface of fruit and foliage, giving lasting and effective results. Chemical ingredients guaranteed. Those growers desiring the dry form of lead will find the new Orchard Brand lead powder convenient to use and effective.

ATOMIC SULPHUR PASTE, a non-caustic fungicide, is safe to use and gives effective and lasting results. It can be safely combined with Orchard Brand Arsenate of Lead when spraying for codling moth control and it is important that it be first added at the time of the calyx spray, in order to start the stimulation which results in increased vigor to the tree, the setting of more uniform crop of fruit and a proper control of mildew, which disease is becoming more general throughout the Northwest each year. When thoroughly applied after blooming time at proper intervals it is also effective in preventing further growth of scab fungus and will control red spiders and mites on fruit trees.

Complete stocks of both Atomic Sulphur and Arsenate of Lead, together with other necessary Orchard Brand Spray materials, carried in the Northwest with the following distributors and many local agents in each fruit district:

GILBERT & DeWITT,
Hood River, Oregon.

BALFOUR, GUTHRIE & CO.,
Portland, Oregon.

ROGUE RIVER CO-OPERATIVE
FRUIT GROWERS' ASSOCIATION,
Medford, Oregon.

MORGAN, McKAIG COMPANY,
North Yakima, Washington.

WELLS & WADE,
Wenatchee, Washington.

McGOWAN BROTHERS HARDWARE
COMPANY,
Spokane, Washington.

SAMUEL LONEY & COMPANY,
Walla Walla, Washington.

C. J. SINSEL,
Boise, Idaho.

Fruit growers will do well to write us giving full description of pests and troubles on their orchards, and we will reply by personal letter as fully as possible.

General Chemical Company
Dept. F-7

San Francisco, California
Manufacturers of

"Orchard Brand"
Spray Materials

the United States, for instance. In Argentina this may be ascribed in part to the fact that the older and more settled parts of the country are not very well suited for fruit growing. The prairies of the eastern and best-known parts of the Republic are exposed alternately to extremes of drought and flood. The drainage, on account of the flatness of the country, is poor, and the region is also subject to late frosts. To Chile, which is a second California in climate and other factors conducive to the growing of good fruit, and where fruit which has mostly been in a haphazard sort of way is both abundant and cheap, such an argument would not apply. The lack of development in commercial fruit growing can be, in part, ascribed to the same conditions for which the general lagging of industrial development in South America is responsible in part to the general belief, in the tropical countries especially, that the eating of large quantities of raw fruits is injurious and might bring on malaria or dysentery, and in part perhaps to the Latin America preference and habit of taking fruit juices in the form of wine particularly, to which are to be ascribed the enormous wine industry of both Argentina and Chile. The enormous and well-organized industry of banana growing of Colombia and Central America, constitutes an exception to what has just been said, but it is really conducted by and for the benefit of Northern people. There are more, better and usually cheaper bananas to be had in any American city than in the average South American place. Often one never sees either the quality, quantity or wealth of varieties encountered in any of the large American cities. One of the first things noticed by the passenger from a South American port is the wealth, frequency and attractiveness of fruits displayed in the American cities. In Buenos Aires, except for its excellent public markets, numerous and conveniently located, but still quite far apart on account of the great size of the city, and except for an occasional street vendor with wagon, cart or basket, it is difficult to find fruit for sale; on Sundays it is impossible, except with meals at hotels or restaurants, to obtain it at all. Reviewing the fruits seen in the city markets it might be said that the orange from September to December, the peach from New Year to April, and the grape from January to May, easily take first rank in the Argentine capital among the fruits, but their position is now threatened by the apple and, above all, by the American apple.

During the summer of the southern hemisphere the American apple season is at its height in Buenos Aires. The first apples of the season encountered were some Gravensteins, encountered during the month of September, in a small town in the interior of one of the southernmost territories of the Republic. They sold for the reasonable price of one peso (forty-two cents) per dozen, and had come some 11,000 miles all the way from Sonoma County, California. During the season of 1914 and 1915, the apples most prominent in the



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Extent of the honey market?—Profits per bee-colony?—Number of colonies you could handle?—What a pleasure bees are?—How the cityman keeps his? Write to us for the answers to these and other questions about the fascinating business of bee-keeping. We will also tell you how little it takes to make a start. We have a

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The Inland Empire
Trail of Lewis and Clark
Glacier Park
Yellowstone Park
Buffalo Bill's Country
Mississippi River

Summer tourist rates and literature on request.

R. H. CROZIER, A. G. P. A.
Portland, Oregon.



capital were Rome, King, Spitzenberg, Stayman, Jonathan and Delicious. There were a few boxes of "Oregon Beauty"

and some splendid specimens of Winter Banana. By March the New Zealand product began to appear, and by June was more plentiful than the American. The small dealer buys apples at from five to seven dollars per box and retails the fruit at from seventy-five cents to two and a half dollars per dozen. A fair idea of the prices may be gained by taking a box containing eighty apples; for this the dealer would have to pay to the importer five dollars, selling the same again at one dollar per dozen. The market was flooded with Delicious last season, although it still, with the variety Winter Banana, sold somewhat higher than other varieties. Delicious, running fifty-six to the box, retailed at \$1.75 per dozen, and some Banana of equal sizes at \$2.50. On the better varieties the dealer makes about fifty per cent. A large department store situated on Buenos Aires' fashionable shopping street often made a special feature with a very attractive window exhibit of American boxed apples at somewhat reduced price. It is both remarkable and curious what a hold the word California has upon the outside world. It is known to practically every Italian and Spanish immigrant with whom one comes in contact, parties who usually also have heard of New York and Chicago, but to whom such names as Kansas or Pennsylvania would be as from an ancient classic. The exhibits of apples were nearly always labeled "Manzanas de California" and at times as "Manzanas del Canada" or "del Oregon," although every single one of them and nearly every other box of American apples encountered in Buenos Aires came from the Wenatchee Valley, Washington. The same can be said of the source of pears seen there, among which were such varieties as Onondaga, Anjou and Flemish Beauty. Barreled apples from the Eastern States and Nova Scotia, represented almost entirely by the variety Ben Davis, were consumed in the capital more for culinary purposes and much shipped to the interior towns. They were the apples generally found in the dining cars of the railroads. In the month of March the first of the fall apples of the southern hemisphere commenced to come into their own.

Among the fruits coming from New Zealand are such varieties as Worcester Permain, Cleopatra, Monroes' Favorite, Glory of South, Jonathan and Commerce; there are unlabeled varieties from Chile; and then the home product, none of which compared in flavor and attractiveness with those imported from the Wenatchee Valley. Below is a table of the apples imported into the Argentina Republic for the last three years, or ever since apples have been listed separately from other fruits. The figures are in Argentine gold, for practical purposes and round numbers the same as the United States currency:

1912	1913	1914
\$96,794	\$208,371	\$198,433
15,562	52,944	80,577

The Reason Why



LATIMER'S Dry Arsenate of Lead

has won the confidence of the growers is because of its reliability. Out of the many samples analyzed by the Government and the different states not one has been found to fall below our guarantee.

There are insecticide laws fixing the chemical requirements of arsenate of lead, but no official control is exercised over the physical character of the product.

The physical nature of arsenate of lead, whether it is coarse or fine, soft or lumpy, is of equal importance with the chemical composition.

It is difficult to make a coarse, heavy lead stick to the fruit and foliage, as a good deal runs off with the dripping water; furthermore it does not cover uniformly, but dries in blotches.

Unless the trees are protected by an even covering of poison clean fruit cannot be expected.

LATIMER'S DRY has won its position in the insecticide field because it produces results.

LATIMER'S DRY does not require artificial adhesives to make it stick. Its extreme fineness gives it ideal sticking and covering properties.

Each step in the manufacture of LATIMER'S DRY is under rigid chemical control and we know that every pound that leaves our factory is right physically and chemically.

Do not bargain hunt when you buy your spray.

Cheapness is not the first consideration, but dependability.

Let LATIMER'S DRY convince you this year.

The Latimer Chemical Company

Grand Junction, Colorado

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Milton Fruit Growers' Co-operative Association, Milton, Oregon.
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Spokane Fruit Growers' Company, Spokane, Washington.
The Coffman Company, Spokane, Washington.
Wenatchee Produce Company, Wenatchee, Washington.
Yakima County Horticultural Union, North Yakima, Washington.
The Pacific Fruit & Produce Company, North Yakima, Washington.
Richey & Gilbert, Toppenish, Washington.
The Morgan Lumber Company, Zillah, Washington.
The Fruit Growers' Exchange, Hood River, Oregon.
Walther & Williams Hardware Company, The Dalles, Oregon.
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The Happy "Independent" Apple Shipper!

No Heavy "Overhead" Expense! No Waiting for Division of Returns on "Pool Cars"! No "Double Commissions"!

As a large Apple Grower I concluded
There was no use of being deluded
I had apples to sell year after year
And b'gosh I am selling them—don't you fear.
I am not hiring anybody with a scheme
To "Distribute"—"Market"—or any such dream.

I am, with good neighbors near by, a few
Selling "on track" or "usual terms"—cars a few
We're not setting any rivers afire
But we're selling apples—or I'm a liar.

"How are we doing it?"—it's nothing new,
Just the same way the Distributors do—
Send out circulars—and sometimes we wire
To Jobbers, or Brokers—to get a buyer.

We tell them the kind we have, and what grade.
Ask if they're in the market—want to trade
To make us an offer—the best they can,
Or better still to send along their man
So he can see the apples for himself.
At the same time to bring along the "pelf"
As we'd rather sell here for a dollar
Than to "ship," with the chance of a "holler."

Some of them do come—that of course depends
On their ideas and the market demands.
If we ship—"Draft on Bill Lading"—is our terms
Except to "TRADING MEMBERS"—they're good firms!

When we can't plenty of buyers find
For our apples—the balance are consigned—
To such commission merchants as are "good"—
Who are known to treat shippers as they should.

How do we know which are "good," which are "bad"?
A very good guide is now to be had
It is the Produce Reporter's Blue Book
In which Members at any time can look.

It shows the "kickers," "over-quoters" too—
The kind that are "layin" for me and you.
From its ratings you can tell at a glance
(There is no need of taking a "long chance").

These ratings are based on the firms historee
How they've treated others (like you and me).
If you can find a better guide than that
I'll buy you a suit of clothes and a hat.

Of course, sometimes a car is "rejected,"
But I'm not downhearted or dejected.
I wire Produce Reporter to inspect,
Adjust—do what's right—that's all I expect.

Their "Service" will your full requirements meet—
Write them Chicago, 212 W. Washington Street.

The first row of figures gives the values of the total imports and the second those from the United States alone. While there is a slight falling off in the total imports of 1914 as compared with 1913, due undoubtedly to the business depression existing at that time, it will be seen that during the same period the imports of apples from the United States and from New Zealand was from the 1914 only \$4,798, while that of the imports from the Republic of Uruguay was \$91,920. These statistics go to show that not only the consumption of apples is on the increase in Argentina, and this would apply in varying degrees to all South American countries, but that the taste for a better class of this fruit has been created and is developing faster even than the rapidly-growing population. The outlook in the trade in high-grade boxed product of North America is, therefore, especially bright, to say nothing of the creation of a demand for and the development of a trade in other higher grade fruits such as the pomelos, grapes, Mazzard cherries and other stone fruits. In seeking to develop the trade in fruit with Argentina or other parts of South America it must always be borne in mind that the seasons in that continent are the reverse of what they are here, in that the fruits in season here are out of season there, allowing the fruit exporters to ship to Buenos Aires the same manner, for instance, as South Africa already ships to London and New York. In the apple trade North America will probably never seriously have to fear any competitor. Europe is already an importer on a large scale, and in New Zealand and South America, even should it ever be possible to grow and market a better quality of apples there than at present, the shipping season of apples only in part overlaps that of North America. And this brings us to the planting and growing of apples in that part of the world.

The apple is little grown in Argentina at the present time. The mountains of Cordoba, lying about the same latitude south as does New Orleans in the North, and about 400 miles due northwest by a straight line from Buenos Aires, in the interior of the country, once produced large quantities of apples said to have been of good quality. The region is sub-tropical in its location and only the high altitude with its resulting low temperatures could have made apple growing possible, but at the present time the apple has practically disappeared from the Cordoba Mountains. In the islands near Tigre, and about an hour's ride by train from Buenos Aires, where the almost sub-tropical climate would be considered most unfavorable for the growth of the apple, the apple is still largely grown at present. The inundations caused largely by the meeting of the waters of the river and tides and the isolation of the orchards probably do much to prevent the development and spread of the woolly aphis, a pest which has attacked nearly every apple tree in the Republic and

Special Magazine Offer

The Editor of World's Work was in Europe a few weeks ago and arranged to have Arno Dosch-Fleuret go to Russia to be on the job in the present crisis. During the next five months World's Work will feature the international situation with complete stories by cable.

Our Special Offer Five months subscription to World's Work for **\$1.00**. If you want to avail yourself of this splendid offer, send your name, address and \$1.00 for World's Work for five months, which must reach us by May 25th. If you want "Better Fruit" for a full year, in addition to World's Work, send **\$2.00**.

BETTER FRUIT PUBLISHING CO., Hood River, Oregon

Arno Dosch-Fleuret is the son of Col. Dosch, of Portland, Oregon, and has been in Europe since the beginning of the war. For reasons well understood and unnecessary to mention he found it necessary to change his name from Arno Dosch to Arno Dosch-Fleuret, Fleuret being his mother's family name.

ORCHARD YARN

Listen, Orchardists: Now is the time to tie your fruit trees. All limbs can be readily seen; the spurs are less easily broken off than later; the saving of time is considerable and yarn is probably as cheap as it will be this season. **Orchard Yarn** is the correct method of supporting trees and the saving of a few trees is worth the cost of the yarn for an entire orchard.

Sold by all dealers. If they cannot supply you, please order direct from

The Portland Cordage Company
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Attention, Fruit and Vegetable Growers

CAN your Fruits, Vegetables, Meats and Fish in Sanitary Cans, with the H. & A. Steam Pressure Canning Outfits, built in Family, Orchard and Commercial size; seal the cans with the H. & A. Hand or Belt Power Double Seamer; they will save your perishable fruits and vegetables at ripening time when nothing else will. Write for descriptive matter.

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to hear from owner of good Ranch for sale. State cash price and description.

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Minneapolis, Minnesota

which is undoubtedly responsible for the extermination of the apple from Cordoba. The variety most seen in the markets is a medium sized somewhat flattened green apple with brown blotches bearing the descriptive name of "cara sucia" or "dirty face." It seems to be also the variety imported so largely from Uruguay and is evidently a good keeper, as it is found on sale as late as November, equivalent to May in this country.

Argentine fruitgrowers and nurserymen have not been oblivious to what is going on in their line in other parts of the world. A hasty look into any Argentine nursery catalog or a look into any private collection may easily prove this. There are several large and many small nurseries owned and worked principally by Italians or their descendants, using generally the same

There is a regular agency for New Zealand trees in Buenos Aires, where the stock is gaining in favor over that imported from Europe or North America, as the identity of seasons does away with so many difficulties in transplanting. Chilean nurseries are often patronized for the same reason, and on account of their proximity. New Zealand trees sell at one dollar apiece in large or small quantities. The government is doing something to help promote the wider planting of fruit trees. Aside from a big school, with station in viticulture in Mendoza, other agricultural schools, such as those of San Juan and Cordoba, have a horticultural department giving special attention to instruction in fruit growing. Unfortunately the tendency in some of these places with European instructors is to give undue attention to the espalier type of training and pruning, so much in vogue in the thickly-settled parts of Western Europe, and which has no practical application in a new and sparsely-settled country. The section of markets of co-operative action has been established among fruit-growers, with the object of eliminating the middleman. A few years ago the Argentine Department of Agriculture imported a large consignment of nursery stock, containing nearly a hundred varieties, from a firm in the United States. In this shipment there were thirty kinds of apples alone, which were all saved in spite of having arrived in midsummer under very trying conditions for the plants. And in connection with this it may be well to advise those wishing to export nursery stock to the extreme south to dig only well matured in the fall or early spring; keep in cold storage, according to whether the plants are destined for the warmer or colder latitudes, allowing thus about a month for the voyage and the arrival of the shipment in the fall of the southern hemisphere.

A word in regard to the growing of the apple, now the most neglected and soon perhaps to be the most popular fruit among consumers of the apple in the Argentine Republic. A table giving the essential climatic conditions of the centrally located point of the Valley of Rio Negro in comparison with a few of the successfully irrigated regions of the west might have great influence upon those who might think of growing apples in a country where no home-grown product exists to supply the demand of the season:

	Wenatchee, Washington	North Yakima, Washington	Rogue River Valley, Oregon	Cincolletti, Rio Negro Valley
Altitude	1,164 feet	1,000 feet	956 feet	871 feet
Rainfall	14.33 inches	8.67 inches	32.20 inches	5.30 inches
Lowest temperature observed..	-16 Jan.	-20 Jan.	0 Jan.	10 July
Highest temperature observed..	101 July	108 July	110 July	106 Jan.
Mean temperature	48 deg.	50 deg.	53 deg.	58 deg.
First frost observed.....	Oct. 1	Sept. 6	Sept. 11	Mar. 15
Last frost observed.....	May 21	June 14	June 13	Nov. 5
Average date of first frost.....	Oct. 21	Sept. 21	Oct. 12	Apr. 7
Average date of last frost.....	Apr. 30	May 23	May 6	Oct. 4

stock as do well there. Many American varieties are already listed, but they are obtained for the most part indirectly via Italy and France, countries which already supply the majority of the varieties handled by them.

There is undoubtedly a future for the production of apples in all that part of Argentina south of the Rio Colorado, or which used to be known as Patagonia, wherever water is available for irrigation and wherever communication with

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White River Flour

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Nice Bright Western Pine FRUIT BOXES AND CRATES

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Fruit and Ornamental Trees, Shrubs, Vines, etc. Free Catalog. Agents Wanted. Special Terms.

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MILTON, OREGON

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Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

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Stocks carried at Seattle, North Yakima
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ALPHA Automatic Power Sprayers

If your old sprayer is not doing efficient, thorough work don't put off the purchase of an **Alpha** until next season. Install one now and get the benefit of its use this year as well as next.

Order now for immediate shipment.

Wire or write for particulars.

DeLaval Dairy Supply Co.
SAN FRANCISCO, CALIFORNIA

many fertile valleys suitable for cultivation, wild apple trees have been known to be growing throughout a large district, bearing large quantities of good fruit as far back as over a hundred years ago.

Although no American varieties are known to be bearing in the region at the present time, nevertheless judging from the data given by the climatic table, from the remarkable spread and thriftiness of the wild apples found there, and further from the appearance and behavior of both apple and pear trees in the Rio Negro Valley, one is led to conclude that the great market varieties of the Western States will succeed there. These would then find a ready market at high prices in Buenos Aires and other towns of the Republic, and even in Uruguay and South Brazil, not competing with but following apples of the same grade now imported from the United States.

Bees Help Fruitgrowers

Did you have a full apple crop last year? Failure of some varieties of apples may be due to lack of pollination. T. J. Talbert, of the College of Agriculture, told Farmers' Week visitors at the University of Missouri recently how bees helped to make a fruit crop. Many varieties of apples like Arkansas Black, Jonathan and York Imperial are self-sterile and cross-pollination is absolutely essential if a set of fruit is obtained. Other varieties like Ben Davis, Yellow Transparent and Willow Twig are only partly self-fertile and again cross-pollination is necessary. The numerous white showy flower clusters act as a guide to the insects and may attract them far away. When a bee alights on a flower its hairy body may be covered with pollen from another variety of apple. As the bee works its way down to the bottom of the flower to get the nectar it rubs its dusty body against the stigma or female organ of the flower and cross-pollination is accomplished.

It is a well-known fact among the best fruitgrowers that the weather conditions during fruit bloom has much to do with the setting of the fruit. If the weather is clear and warm at blooming time the bees are active and cross-pollination proceeds rapidly, while if the weather conditions are wet, cloudy and cold the insects are not active and usually a poor set of fruit is secured. Strong, cold winds may often prevent the bees from cross-pollinating one side of the apple trees, and this may account for the set of fruit on only one side of the trees. Actual counts and observations at blooming time have shown that the honey bee is decidedly the most important insect in the work of pollinating the fruit flowers. Many counts have shown that from seventy-five to ninety per cent of the insects pollinating the blossoms were honey bees.

The wind cannot be relied upon as an agency to transfer pollen from apple tree to apple tree throughout the orchard. This work must be accom-

FRUIT-GROWERS' GREATEST LABOR-SAVING DEVICE

TOWERS AND SPRAY POLES HAVE
GONE FOREVER

"FRIEND"
NUSYS™ SPRAY
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DOES THE
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WORKS EASY

A simple turn of the wrist sprays close or far

SAVES LABOR

One nozzle man to a Sprayer

SAVES TIME

Moved quickly. Taken anywhere
No catching or clogging

SAVES MONEY

Costs less than old style equipment. Works
on any Sprayer

Write To-day. Name this Paper. Agents Wanted

Yakima Rex Spray Co.

Sales Agents for

Montana, Idaho, Oregon, British Columbia

Pittsburgh Perfect Cement Coated Nails are of the highest standard

The Heads don't come off. Given Preference by Largest Pacific Coast Packers

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PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.

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359 Monadnock Building, San Francisco, California

Cabot's Insulating Quilt Best Insulation for Fruit Storage Houses

Building Papers, Roofing, Building Material, Paint
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Buenos Aires is possible. By the time orchards could come into bearing some of the railroads would probably have been extended to tap the almost inexhaustible timber regions of Southern

Chile, not far distant, and thus have opened up a supply of material suitable for the making of boxes and barrels. Just to the west of Rio Negro, in the territory of Newqueen, where there are

plished by insects, and the honey bee is by odds the most important of them all. Bees will pay for their keep in honey, aside from their services in fruit production.—Bulletin, University of Missouri.

Canning Fruit Without Sugar

High cost of sugar at the present time is causing considerable worry among the housewives who desire to do their accustomed canning of fruit. With the view to meeting this problem the State Experiment Station at Pullman, Washington, issued a bulletin on "Canning Without Sugar." There is a common notion among housewives that to do canning effectively, a considerable amount of sugar is necessary.

Dr. J. S. Caldwell, author of the above-mentioned bulletin, calls attention to the fact that practically all fruits may be canned without the use of sugar. Such fruit preserves more of the natural appearance and flavor than does the fruit put up in heavy sugar syrup; is fully as palatable and much more easily digested; is in better condition for use in cooking, and is available for all purposes for which fruit canned in syrup could be used. The bulletin points out that while heavy sugar syrup aids in a slight degree in preventing growth of the yeast and bacteria which caused spoilage, perfect sterilization makes the use of sugar unnecessary.

The bulletin gives detailed directions for canning without sugar by the "Cold-Pack Method" and by the "Open-Kettle Method." Attention is also called to methods of canning in tin cans, together with recipes for canning with the use of sugar for those whose purses will permit of this method at the present time. A number of valuable suggestions are made in regard to the handling of fruits, containers, etc., with a view to economizing labor and insuring a better preservation of fruit. The bulletin may be obtained upon application to the Experiment Station.—Washington Agricultural College Bulletin.

Don't Summer Prune Raspberries

The raspberry plant finds an especially favorable climate in most of the State of Washington. The crops produced are usually far above the average for the United States. The plants are extremely vigorous and productive and the quality of fruit produced is the best.

The practice of summer pruning followed in the Eastern States does not seem to be well adapted to this plant when grown in the Northwest. The vines grow tall, often reaching a height of seven to nine feet, and if cut back in the early summer will branch and send out good strong limbs. If pruned a little later in the summer the tendency is to cause the vines to winter kill and suffer to such an extent that the crop is greatly lessened the following year.

Tests along this line at the State College of Washington indicate that the best returns will be obtained by giving thorough, clean cultivation and doing



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energy. In addition to all these, you are drinking the purest of water and eating the most healthful and desirable fiber for the required "roughness" in food elements. The acids of apple diminish the acidity of the stomach and prevent and cure dyspepsia. They drive out the obnoxious matters that cause skin eruptions and thus are nature's most glorious complexion makers. They neutralize in the blood the deleterious elements that poison the brain and make it sluggish. The contained phosphorus is not only greater than in any other form of food, but it is presented in a shape for immediate use by the brain and nerves, where it may flash into great thoughts and great deeds. The ancients assigned the apple as the food for the gods, and its juices the ambrosial nectar to which they resorted to renew their youth. Men are the gods of today, and the apple is their royal food, the magic renewer of youth. Eat a rich ripe apple every day and you have disarmed all diseases of half their terror.—Exchange.

Flag Etiquette.

1. The proper time for raising the flag is sunrise or after, never before. 2. The flag must be lowered at sunset. 3. In draping the flag against the side of a room or building, the proper position for the blue field is toward the north or toward the east. It is a mark of disrespect to allow the flag to fly throughout the night. There is no uniform usage in the display of bunting, but it is just as easy to hang it in the correct fashion. When buildings are decorated in bunting draped horizontally, the red should be at the top, according to a letter from the War Department published in the New York Sun:

"There are no regulations prescribing the method of utilizing bunting for decorative purposes, but good taste requires that the order shall be, red at the top, followed by white, then blue, in accordance with the heraldic colors of the national flag."

A city lad from the densest tenement district was taken to the country by a farmer. A few days later he was called early one freezing cold morning before dawn to harness a mule. The lad was too lazy to light a lantern, and in the dark he didn't notice that one of the cows was in the stable with the mule. The farmer, impatient at the long delay, shouted from the house: "Billy! Billy! What are you doing?" "I can't get the collar over the mule's head," yelled back the boy. "His ears are frozen."

The town council of a small Scotch community met to inspect a site for a new hall. They assembled at a chapel, and as it was a warm day a member suggested that they should leave their coats there. "Someone can stay behind and watch them," suggested another. "What for?" demanded a third. "If we are a'gandin' oot t'gether, whit need is there far any o' us tae watch th' clothes?"

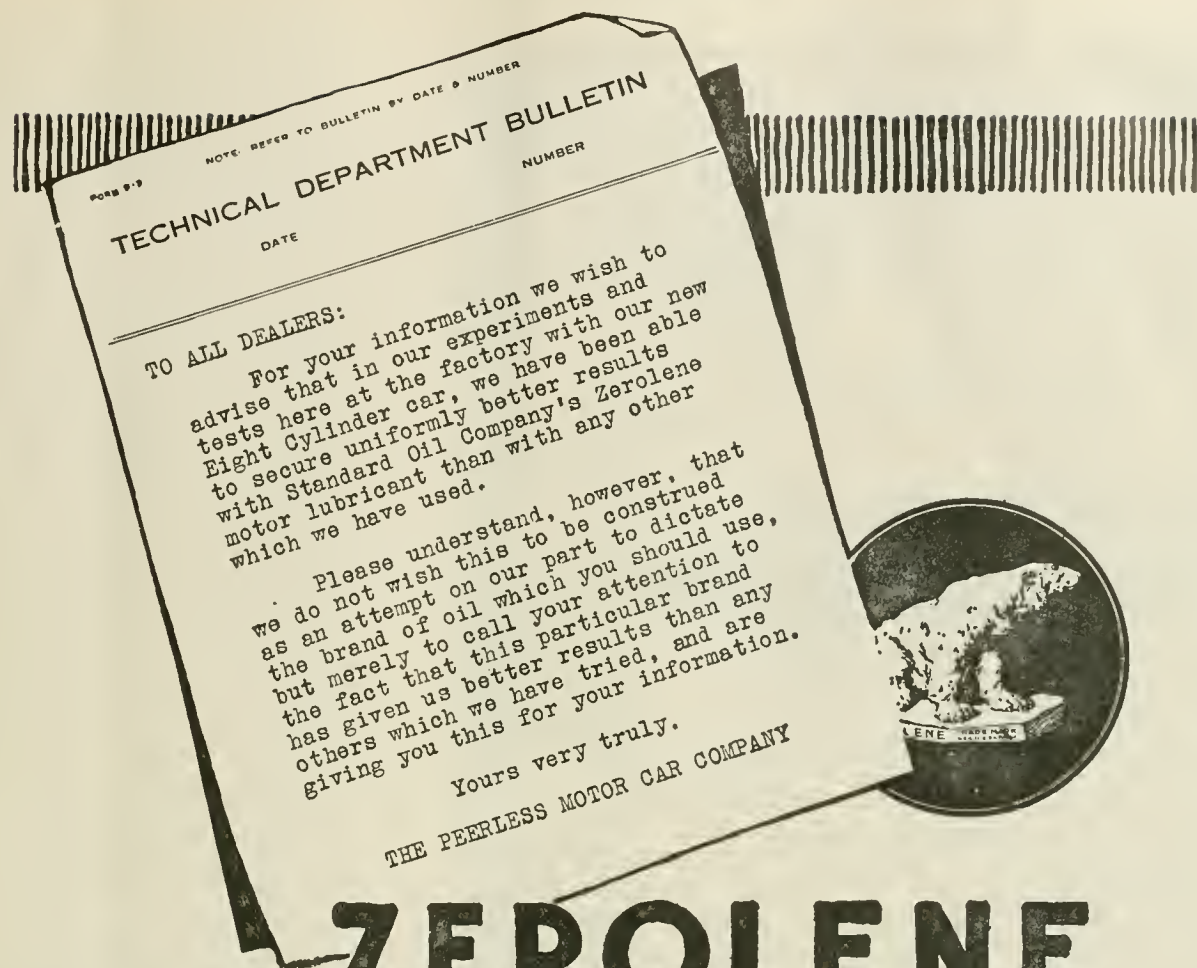
all of the pruning in the winter time. All of the summer pruning done has resulted in injury to the plants. Some growers report fair success with summer pruning, but the general indications are that summer pruning will result in injury to the plants, while in a very few cases it resulted in a definite benefit to the plants or to the crop produced.

Where summer pruning is done the best system is to cut off the top bud when the vines reach the height desired. This will cause them to send out lateral branches. If the work is done early enough and the latter part of the season is dry enough, the side branches will mature and suffer very little from winter injury, but if the work is not done early and the land dried suffi-

ciently to stop growth, winter injury will result. Some patches have been practically killed by the late summer pruning.—O. M. Morris, Horticulturist, Experiment Station, Pullman, Washington.

On Apple Eating.

Do you know what you are eating when you eat an apple? You are eating gallic acid, one of the most necessary elements in human economy. You are eating sugar in the most assimilable form, combined carbon, hydrogen and oxygen caught and imprisoned from the sunshine. You are eating a gum allied to the "fragrant medicinal gums of Araby." And you are eating phosphorus in the only form in which it is available as the source of all brain and nerve



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A Note to Legume Growers

State Agricultural Experiment Station, Pullman, Washington

EXPERIENCE in the growing of leguminous crops,—peas, alfalfa, vetch, clover, etc., shows that these crops make far better returns when the soil contains the bacteria which cause nodule formation upon the roots of the plants. These bacteria living in the nodules take the free nitrogen from the air, which as such cannot be assimilated by the plants, and combine it into such a form that it can be utilized. In this way, nitrogen, which is so essential for crop production, and yet is so

expensive to purchase in the form of fertilizer, is obtained in very appreciable quantities from the air without cost.

Progressive farmers are beginning to realize the importance of these facts. It is well worth while to see to it that the land upon which these crops are to be grown contains these bacteria, and unless these crops have been grown successfully, soil inoculation should always be practiced. This may be done in several ways. One method is

to take the soil from fields where the particular legumes have been successfully grown and to distribute it over the field to be treated. If this method is used the soil should be worked in immediately since if exposed to the sun the bacteria will be weakened. Owing to the fact that weed seeds and various plant diseases are readily spread in this way, this method should be practiced with caution. By far the best way to get the desired results is by the use of pure cultures.

There are to be had upon the market various commercial products which are advertised to contain the nodule-form-

Make One Spraying Do the Work

Combine your sprays. Lime-Sulphur, Arsenate of Lead and Bordeaux are death to Scale, Codling Moth, and Fungus, but harmless to Aphis, Pear Psylla, Leaf Hopper, Woolly Aphis, Thrips and other soft-bodied, sap-sucking insects that are destroying fruit and fruit profits. For these pests spray with

Black Leaf 40

40% Nicotine

Kills
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By using it with other sprays, you make one spraying do the work of two, or even three. Experiment Stations and Agricultural Colleges recommend combined sprays.

Now is the time to spray. Do you realize that Aphis is a positive menace to your orchard profits? Black Leaf 40 won't fail you. It's highly concentrated. Requires only small quantity. Cost is low. Use it, and grow better fruit.

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The Kentucky Tobacco Product Co.

INCORPORATED
Louisville, Kentucky



ing bacteria, but the use of these preparations is frequently unsatisfactory, for the reason that the bacteria are often no longer living, or at least are not vigorous enough to bring about the desired effect. To meet the needs of Washington farmers, in this respect, the Experiment Station had undertaken to supply them with pure cultures of the legume bacteria in such a condition as to assure the maximum results.

The preparation and shipment of these cultures is carried on by the Division of Bacteriology. The organisms are cultivated in the bacteriological laboratories upon suitable nutrient substances, and when ready for shipment are transferred to cans of sterile sand. In this form the cultures reach the farmer. All that is necessary for use is to mix the moist sand with the seed and to sow in the usual manner. By this method both the seed and the soil are inoculated. Since sunlight soon kills the bacteria they should not be exposed any longer than necessary while the seed is being sown.

In order that the Experiment Station may render its best service to the farmers, and in order that farmers may experience a minimum of difficulty in obtaining cultures, and at the same time information and advice upon matters pertaining to crops, the Bacteriology and Agronomy Divisions co-operate in the matter, and the cultures may be obtained by application to the agronomist. The charge is 25 cents for each acre treated, this amount merely covering the cost of preparation.

It is very essential that cultures used be fresh, and for this reason it is necessary that they be freshly prepared in each individual case. This means that orders must be submitted as early as possible and should reach the Experiment Station at least two weeks before the cultures are needed for use. The approximate date of sowing should be designated in each order. This co-operation on the part of the farmers will be repaid by more prompt service, and with more satisfactory results in the field.

Timely Hints for Home Gardener

Garden peas are a favorite crop in the home garden, and as they are not easily injured by light frosts they may be planted as soon as the soil can be put in order in the spring, according to the specialists of the United States Department of Agriculture. By selecting a number of varieties it is possible to have a continuous supply of peas throughout a large portion of the growing season. In order to accomplish this plantings should be made every ten days or two weeks until warm weather comes. The first plantings should be of small-growing, quick-maturing varieties, such as Alaska, First and Best, and Gradus. These kinds do not require supports. They should be followed by the large wrinkled type of peas, such as Champion of England, Telephone and Prize Taker. These may be supported on brush, on strings attached to stakes driven in the ground, or on wire netting.



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Peas should be planted about two to three inches deep in rows three to four feet apart. Some gardeners, however, follow the practice of planting in double rows six inches apart, with the ordinary space of three to four feet between these pairs of rows. With varieties requiring support this is a good practice, as the supports can be placed in the narrow space between the rows.

Beans are more susceptible to cold than peas and should not be planted until danger of frost is past and the ground begins to warm up. They are, however, among the most desirable vegetables that the home gardener can raise. There are many different kinds and varieties of beans, but for garden purposes they may be divided into two classes—string and lima. Both classes are grown commercially over the greater part of the East and adapt themselves to a wide diversity of soils and climate. They grow rapidly and, therefore, leave the area in which they have been planted free for another crop. To secure a continuous supply it is desirable to make plantings at intervals of ten days or two weeks from the time that the ground is reasonably warm until hot weather sets in.

Both string and lima beans are subdivided into pole and bush types. The pole lima bean should be planted with from eight to ten seeds in the hill and after the plants become established should be thinned to three or four. The



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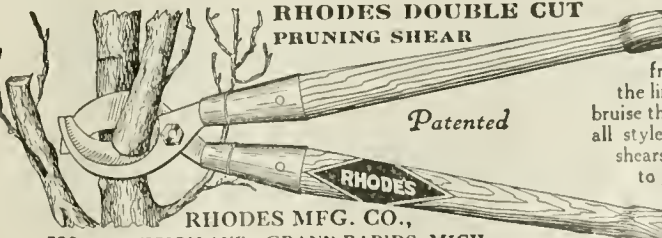
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hills should be four or five feet apart. Bush lima beans are planted five or six inches apart in rows thirty to thirty-six inches apart. Bush beans of the string type may be planted somewhat closer—the plants standing three or four inches apart in rows from twenty to twenty-four inches apart if hand cultivation only is to be employed. Beans of any kind should not be planted any deeper than is necessary to secure good germination. This should never be over two inches and on heavy soil it should not be more than one and one-quarter to one and one-half inches.

Beets can be planted comparatively early in the season. It is not necessary to wait until the ground has become warm, if the danger of frost is past. The seed should be sown in drills fourteen to eighteen inches apart and covered to a depth of about one inch. As soon as the plants are well up they should be thinned to stand three to four inches apart. From two to three plantings should be made in order to have a continuous supply of young, tender beets.—Office of Information, U. S. Department of Agriculture.

Preparing the Garden Soil

A simple test to determine when garden soil is ready for plowing or working is to take a handful of earth from the surface and close the fingers tightly on it. If the earth compacted in this way is dry enough for cultivation it will fall apart when the hand is opened. This test is applicable only to comparatively heavy soils, but it is these which receive the most injury if they are worked when wet. On such soils overzealous gardeners not only waste their time, but frequently do actual damage by attempting to work them too early.

After plowing or working with a spade, it is usually desirable to apply some form of fertilizer. Barnyard or stable manure, which furnishes both plant food and humus, is undoubtedly the best, and applications of from twenty to thirty tons to the acre are satisfactory. The manure should be distributed evenly over the surface and later worked in with a hoe and rake. Frequently it is advisable also to apply commercial fertilizer, especially phosphate. An application of 300 to 600 pounds of acid phosphate to the acre is usually sufficient. In order to supply potash, if this is needed, unleached wood ashes may be distributed over the garden at the rate of 1,000 pounds to the acre. Wet or leached ashes have less fertilizer value. Two thousand pounds of these should be used. In order to start the plants early in the spring applications of 100 pounds to the acre of nitrate of soda are sometimes used. It is important, however, to remember that no form of commercial fertilizer will yield good results unless the soil is well supplied with humus. This frequently may be furnished in the form of sod or other vegetation which has overgrown a garden spot and may be turned under with a plow or spade.

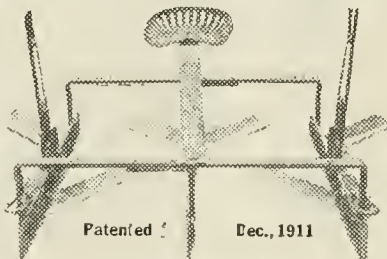
In certain localities it is also advisable to test the soil for acidity. Natur-

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Farmers, order early if you want the Golden Gate Weed Cutter and Mulcher, as the demand this year will be great, as it not only cuts weeds, but kills them, and leaves finely pulverized top soil. Cuts any depth. Prevents evaporation by working under the soil without disturbing soil on top. Write for circular.

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ally moist soils are likely to be sour and in such a condition are not likely to produce the most satisfactory crops. The test for acidity or sourness is a very simple one. A handful of the soil slightly moistened and a piece of blue litmus paper, which can be obtained from any drug store, are all that is necessary. When placed on sour soil the paper will turn red. To correct such a condition lime should be used. The ground should be covered with a thin coat of air-slaked lime and the latter worked in well. Lime is not a plant food, but it will correct the acidity and improve the physical condition of the soil.—Office of Information, U. S. Department of Agriculture.

How to Mix Bordeaux Mixture

Standard Fungicide May Easily Made
With Attention to Certain Details

Bordeaux mixture, the standard fungicide for use in controlling disease on plants, may be easily made by a little attention to a few important details. The standard mixture, known as the "4-4-50" formula, is composed of the following ingredients: Bluestone (copper sulphate), 4 pounds; lime (un-slaked), 4 pounds; water, 50 gallons.

The method of making is as follows: Dissolve the bluestone by suspending in a sack in water, and dilute to 25 gallons. Slake the lime, being sure to use only the fresh stone, to an even paste with a small amount of water to start, and when slaked, add sufficient to make 25 gallons. Mix these dilute solutions by pouring together slowly into the spray tank or barrel, through a 20-mesh strainer made of brass wire. Stir well. In large operations it is best to prepare stock solutions of both bluestone and lime. The bluestone may be dissolved at the rate of one pound per gallon of water. The lime may also be slaked at the same rate, one pound to the gallon, being careful to make up water lost by evaporation before using, if kept for any length of time. Stir the mixtures well before using to insure getting one pound of the material to the gallon. By using stock solutions, one man may easily keep three or four power spray outfits supplied with the bordeaux mixture. An elevated platform upon which the mixing may be done will save a great deal of time. As little hand labor as possible should be the rule, and all that should be necessary in a well-appointed mixing plant should be simply opening and closing valves or gates. A scale to weigh the materials used is a necessary part of the equipment.

If the lime happens to be a grade low in calcium, five pounds may be necessary instead of four. Bordeaux mixture should be used fresh.

A combined insecticide and fungicide may be made by adding to this 50 gallons the proper amount of some stomach poison such as arsenate of lead, with no deterioration in the effectiveness of either the bordeaux mixture or the poison.—J. J. Gardner, Colorado Agricultural College, Fort Collins, Colorado.



SOME call these face-stuffers hogs, some call them gophers. But they are getting scarcer and scarcer since gentlemen found out about W-B CUT Chewing. There is no excuse for a man making a monkey of himself today. The fine rich tobacco flavor was put into W-B by nature, the touch of salt brings it out nice and tranquil like, without your worrying your jaw around continually. W-B is getting to be pretty nearly as popular as sunshine these happy days.

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Continued from page 8

are neglecting an opportunity to remove one of our handicaps. Unprofitable varieties exist and they must be eliminated. No up-to-date dairyman keeps a cow that does not grade up well in either gallonage or butter fat. What we need in this business is butter fat or quality, rather than gallonage or quantity.

I know it is much easier to criticize than it is to perform, and I also know that sometimes critics become a condemned nuisance. I don't want to come under that head. I want and intend my criticism to be of the useful and helpful variety. What I do most want to do, though, is to call to your attention the fact that our business labors under two distinct classifications of handicaps,—one unavoidable—as initial cost of our land, freight charges,

distance from markets and high cost of selling. These are, unhappily, fixed. Avoidable—pests, amount of production, quality of production, damage from careless handling, waste of culls, poor grading and packing and thereby loss of reputation and good standing in the markets of the world. These are not fixed. They are variable, and depend for their increase or decrease on our own individual shiftlessness or carefulness. It is up to us as growers to put our best efforts forth to remedy any failings that we may discover at the growing end.

I have had my ear pretty close to the ground for several years past. For every argument I hear on spraying or orchard culture, I hear a dozen on high rates of interest, taxes and freight rates. They are both weighty matters and of great and grave importance, but we can remedy one of and by our own direc-

tion, and the other is a slow and tortuous operation. When I first was introduced into the apple game every village had a branch of this, our society, monthly meetings were held, orchard practice was discussed, experiences were exchanged and the product of our orchard showed the result. Now the local branch of the Washington Horticultural Society active is as extinct as the "dodo" bird. If prohibition ever becomes as acutely operative as has the suppression of orchard lore, then this will be a dry, dry world. There are leaks in our business that must be stopped. No leaky ship can carry a dry cargo, and our ship leaks. It is up to us as growers to uphold the standard of our grades and to so utilize and fertilize our land as to produce both quantity and quality to put in those grades. It's not the label on the box that gets the money, it's the contents; so again I say, "Keep Your Eye on the Fruit."

The United States Weather Bureau during the crop seasons furnishes special weather warning services and information to growers of corn, wheat, rice, sugar, tobacco, alfalfa, apples, pears, peaches, grapes and cranberries.



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BETTER FRUIT

VOLUME XI

JUNE, 1917

NUMBER 12

Special Features

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Grower Can Do His “Bit” for
Our Country



To Can Food with Ordinary
Home Utensils



Preparedness for Winter’s
Food Supply

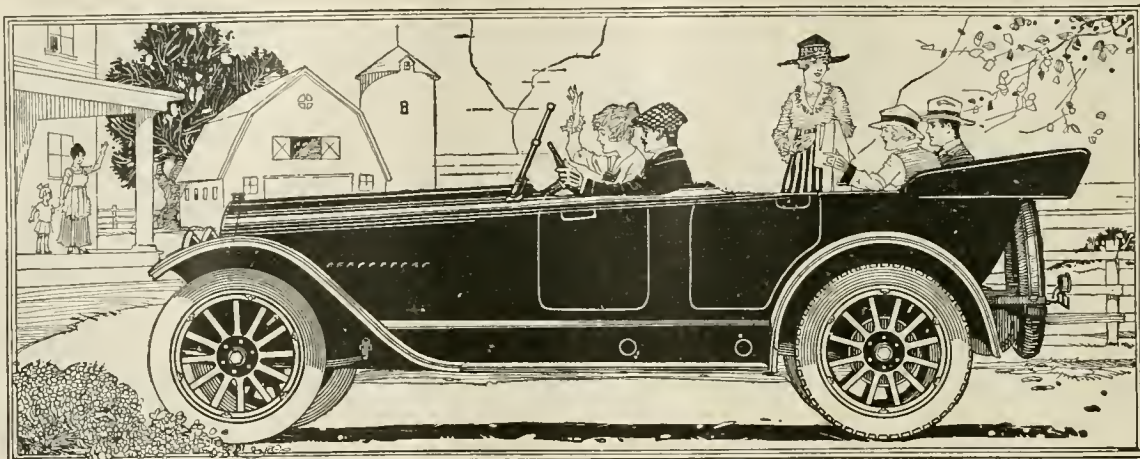


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To the American Farmer

You heard the "call" from the head of your nation addressed directly to you. What have you done about it? The "call" for maximum food production means greater acreages to be prepared, planted and cultivated. Are you equipped to answer your country's demand? You have done it in the past—you, no doubt, will do it NOW.

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

One-Period Cold-Pack Canning with Home Utensils

[Office of Information, U. S. Department of Agriculture]

Can Surplus Food But Use Jars and Cans Wisely

Don't have an empty preserving jar in your home next fall.

There may be some difficulty in securing cans and preserving jars.

Reserve regular tight-sealing containers for vegetables, concentrated soups, meats, and fish.

Concentrate products so that each jar or can will hold as much food and as little water as possible.

Put up jams, jellies and preserves in glasses sealed with cork or paper and paraffine. Pack fruit juices in ordinary bottles.

Don't can anything that can be kept just as well dried or in other forms. Dry navy and mature lima beans for winter use.

Produce in your garden lots of cabbage, potatoes and root crops that can be kept for the winter without canning.—U. S. Department of Agriculture.

Don't let valuable surplus fruits and vegetables go to waste. Adults and children in a very few hours, with little other home equipment than a wash boiler and cans and jars, can preserve much valuable perishable food for next winter's use. Succulent vegetables and fruits are important to health the year round. See that your table is supplied. The simple one-period cold-pack method described is that taught by the U. S. Department of Agriculture for the boys and girls of the canning clubs in the Northern and Western States. With this method thousands of boys and girls each season put up vast quantities of fruits and vegetables. With this method practically every vegetable and fruit grown in this section can be canned. The wash-boiler method described below is entirely effective. Those who desire may purchase home-size water seal, steam pressure or pressure cooker canning outfits which save time and fuel.

Preliminary Preparation for Canning

Provide a false bottom of wooden lattice work, cross pieces of wood, or coarse wire netting for your clean wash boiler or other large, deep vessel to be used for sterilizing. Fill the vessel with clean water so that the boiling water will cover the tops of the jars or cans. Begin heating the water so that it will be boiling violently by the time the containers are packed. See that all cans or jars are in good condition and absolutely clean. Scald them thoroughly. Use new rubber rings and scald them just before putting them on the jars.

Preparing Fruits and Vegetables

Start with clean hands, clean utensils, and clean, sound, fresh products. Throw out all vegetables and fruits which are withered or unsound. Wash

out all grit and dirt. If possible, use only fruits and vegetables picked the same day and never can peas and corn picked more than five hours. Prepare fruits and large-sized vegetables for blanching. Remove all spots from apples. Prepare beans and greens as for cooking. Be especially careful to remove all foreign plants from the greens. Blanch vegetables and all fruits except berries by leaving them from three to five minutes in clean boiling water. Remove the blanched products from the boiling water and plunge them quickly into cold water, the colder the better. Take them out immediately and let them drain. Don't let them soak in the cold water.

From this point on, speed is highly important. The blanched vegetables and fruits, which are slightly warm, must not be allowed to remain out of the jars a moment longer than is necessary. Remove skins when required, and as each article is pared cut it up into proper size and pack directly into the clean, scalded cans or jars. Pack as solid as possible, being careful not to bruise or mash soft products. In the case of fruit, fill the containers at once with boiling-hot syrup. In the case of vegetables, fill the containers with boiling-hot water to which a little salt has been added. Place scalded rubber rings on the glass jars and screw down the tops. Seal tin cans completely. Watch them for leaks. As the pre-

TIME TABLE FOR SCALDING, BLANCHING AND STERILIZING OF FRUITS AND VEGETABLES BY ONE-PERIOD COLD-PACK METHOD—SEE N. R. SERIES

	Scald or Blanch Minutes	Hot Water Bath Outfits at 212° Minutes	Water Seal Outfits at 214° Minutes	Steam Pressure 5 to 10 Lbs. Minutes	Pressure Cooker 10 to 15 Lbs. Minutes
<i>Fruits of all kinds—</i>					
Apricots	1 to 2	16	12	10	5
Blackberries	no	16	12	10	5
Blueberries	no	16	12	10	5
Cherries (sweet)	no	16	12	10	5
Dewberries	no	16	12	10	5
Grapes	no	16	12	10	5
Peaches	1 to 2	16	12	10	5
Plums	no	16	12	10	5
Raspberries	no	16	12	10	5
Strawberries	no	16	12	10	5
Citrus fruits	1½	12	8	6	4
Cherries (sour)	no	16	12	10	5
Cranberries	no	16	12	10	5
Currants	no	16	12	10	5
Gooseberries	no	16	12	10	5
Rhubarb (blanch before paring)....	1 to 2	16	12	10	5
Apples	1½	20	12	8	6
Pears	1½	20	12	8	6
Figs	15	40	30	25	20
Pineapple	10	30	25	25	18
Quince	6	10	30	25	20
<i>Special Vegetables and Combinations—</i>					
Tomatoes	1 to 3	22	18	15	10
Tomatoes and corn	T, 2, C, 10	90	75	60	45
Eggplant	3	60	45	45	30
Corn on cob or cut off	5	180	90	60	45
Pumpkin	5	90	50	40	35
Squash	5	90	50	40	35
Hominy	5	120	90	60	40
Cabbage or sauerkraut	5	90	75	60	35
<i>Greens or Pot Herbs—</i>					
Asparagus	5	120	90	50	35
Brussels sprouts	5	120	90	50	35
Cauliflower	5	120	90	50	35
Pepper cress	15	120	90	50	35
Lamb's-quarters	15	120	90	50	35
Sour dock	15	120	90	50	35
Smartweed sprouts	15	120	90	50	35
Purslane or "pusley"	15	120	90	50	35
Pokeweed	15	120	90	50	35
Dandelion	15	120	90	50	35
Marsh marigold	15	120	90	50	35
Wild mustard	15	120	90	50	35
Milkweed (tender sprouts and young leaves)	15	120	90	50	35
<i>Pod Vegetables—</i>					
Beans (lima or string)	5	120	90	60	40
Okra	5	120	90	60	40
Peas	5	120	90	60	40
<i>Roots and Tubers—</i>					
Beets	6	90	75	60	35
Carrots	6	90	75	60	35
Sweet potatoes	6	90	75	60	35
Other roots and tubers as parsnips or turnips	6	90	75	60	35
Soups, all kinds .....	..	90	75	60	45
Shell fish	3	180	120	90	60
Poultry and game	20	210	180	150	60
Fish	5	180	180	150	90
Pork and beef	30	240	240	210	90

Time schedule given is based upon the one-quart pack and upon fresh-picked products.

liminary treatment has taken care of expansion it is not necessary to exhaust the cans.

How to Sterilize or Process

Put the jars or cans as soon as possible into boiling water in a wash boiler or into your canning device. Let them process for the time specified in the table, counting from the time the water begins to boil again, or the gauge on the canning outfit registers the proper pressure.

When processing fruits in steam pressure canners, not over five pounds of steam pressure should be used. When

processing vegetables and meats do not use over fifteen pounds pressure. After processing, remove the containers. Tighten the tops of jars immediately and stand the containers upside down in a cool place, being careful that no draft strikes the hot jars. Watch for leakage and screw covers down tighter when necessary. Store in a cool, dry place, not exposed to freezing temperature. Use band labels for cans, being careful not to let the glue get on the can itself, as it may cause rust.

From time to time, especially in very hot weather, examine jars and cans, making certain that there are no leaks,

swellings or other signs of fermentation. There will be no spoilage if the directions are followed implicitly and the containers are sealed up tight. Fruits which are put up with heavy syrups can be kept under cork and paraffine seal. Save all wide-necked bottles, glasses and jars for putting up fruit. Vegetables, meats and fish, however, cannot be kept safely unless they are hermetically sealed. Reserve regular jars for products that cannot be packed in other ways. As there may be some difficulty in securing cans and jars, dry or keep in other ways everything that need not be canned.

Manufacture of Fruit Products in Oregon

By Robert G. Paulus, Manager Salem Fruit Union, Salem, Oregon

THE subject "By-Products," so-called, is one that has been receiving a great deal of attention in the Northwest of late on account of coming over-productions of various fruits, and also on account of the fact that with the enormous increase in fruit production a much larger percentage of lower grade fruit finds itself without an outlet in the shipping market, making it necessary to find local methods of disposing of these lower grades to keep them from spoiling. This is particularly true of apples. The grower picks his crop, sorts, grades and packs it, and after taking out his better merchantable apples he finds himself in possession of a quantity of fruit sometimes large, sometimes small, depending on the season and other conditions, on which he has already incurred all the expense of growing and harvesting, and on which it behooves him to try to realize this cost.

The term "By-Products" with relation to the fruit industry is a term very much misused and very much out of place, especially in the way it concerns almost every other fruit grown in the Northwest, except apples and pears. We of the Willamette Valley object very strenuously to this name and figure that the coupling of the name "By-Products" to the canning and packing of fresh and dried fruits is likely to do a great deal of injury to this branch of the fruit business. We maintain that the proper term to use in this connection is "Fruit-Products." The term "By-Products" when associated with the manufactures of the East is usually connected with the refuse left over from the operation of manufacturing a product, such as the case of the hoofs, horns, etc., of the meat-packing houses, the products made from the left-overs of the oil business, etc. Applied to the fruit business it should relate to the utilization of the peelings and cores of an apple-drying plant, or an apple-canning factory, to the stems of the cherries from fruit canneries and the stems and seeds of cherries from an evaporator; the stones of peaches and apricots in canning and evaporating. In the loganberry-juice business it would pertain to the seeds and pulp which is left after squeezing out the juice, and we might carry this on fur-

ther into the manufacture of all fruit products. To some it may seem queer to speak of the utilization of cherry seeds and stem, but this is actually done; these by-products being carefully dried and shipped to Europe, where they are used for making prussic acid, flavoring extracts, etc. In California large quantities of peach and apricot kernels are exported to Europe for this purpose. Peelings and cores of apples are also evaporated and the pectin extracted and used by Eastern jelly manufacturers as a base for a number of jellies.

In the loganberry-juice business pectin may be extracted from the pulp and the seeds furnish a very fine oil which will saponify beautifully, and while they are not as yet being utilized, it is only a question of time until a very fine soap, a perfume base and many other things will likely be made from these seeds, which are apparently worthless.

To get back to the fruit-product business in its true sense, we defend the use of the above term in the fact that in all of the fruit-packing plants in the Northwest, speaking particularly of canneries, evaporators, dried fruit-packing plants, loganberry-juice plants, and plants conducted for the manufacture of unfermented apple juice, only sound fruit, and usually the best fruit we have, is used. Our canneries use only first-class fruits. Our evaporators cannot afford to use fruits unfit to make a product which will not compete with Eastern or foreign goods. Our loganberry-juice factories demand and can use only first-class sound fruit.

From this standpoint you can readily see our position in regard to the attitude we have taken in calling the output of canneries, evaporators, dried fruit-packing plants, juice factories, etc. "Fruit-Products" and not "By-Products," and we believe there should be a concerted action on the part of the fruit interests of the Northwest and the agricultural colleges of these states to gradually eradicate this term from our fruit vocabularies. There is one exception to the above, and that is vinegar, for vinegar, while it is in its fullest sense a fruit product, is sometimes in the class of a by-product. In the old days I have seen apples go into vinegar which even

a half-starved hog would sniff at, and which were wholly unfit for the purpose, and which would not make a product fit for human consumption, but times have changed and more care is being taken even in the manufacture of vinegar. In our dried-fruit department I have instructed our growers not to evaporate anything which in their judgment is unfit in the fresh state for human food; in fact, they have been instructed not to evaporate anything they would not eat themselves. The fruitgrowers of the Willamette Valley have taken a great deal of interest in this matter the past four or five years, and the improvement in the pack of evaporated fruits of the Northwest has been remarkable.

I will now give you a few details of the fruit-products business. Taking up the evaporated prune business first, we will begin with the prunes in the orchard. Picking of prunes usually commences about the first to the fifteenth of September. The prunes are allowed to ripen on the trees and fall off on the ground. In some seasons when the weather is cool and moist the prunes do not have a tendency to fall easily and it is necessary to assist nature by shaking the trees. The prunes are then picked from the ground by pickers and put into boxes. Most growers use a box holding half bushel and one which is built with slatted sides to allow for ventilation. The fruit is then hauled to the evaporator, which is usually owned by the grower himself. It is next put through an operation known as "dipping," in which the fresh prunes are cleansed of the dirt which they have accumulated while on the ground. They are then placed on screen wire trays and placed into the dryer to dry. There are several types of dryers in use in the Willamette Valley, those being most used being known as the tunnel and stack type. In the tunnel dryers the tray of fresh fruit is placed on runways which have a slope toward the back end of the dryer, which is the heat intake end. It has been found advisable not to have too much pitch in the slope on account of the fact that the angle created causes the fruit to roll to the lower side of the tray, sometimes piling the prunes on top of each other, or causing spilling of

the fruit when the trays are moved. The prunes remain in these tunnels from 24 to 36 hours. As fast as the prunes are sufficiently dried they are taken out of the other end of the evaporator and more prunes put in at the front end to take their places. They are immediately sacked in 100-pound manila sacks and as soon as possible taken to the association packing house. Here the grower is given a receipt for the net weight of his prunes and they are run over a grader which sorts out the prunes according to size, and as the large prunes are worth more than the small ones each grower is given credit for his fruit as it actually grades when final settlement is made. From the grader the prunes are then put in bins for each size, where they remain until they are packed. The prunes are next put through the operation known as "processing" before being packed, and they go into the boxes hot. Where prunes are sold unfaced they are practically never touched by human hands after being put into the processor, until they are opened in the East by the retailer. Where prunes are sold faced it is necessary for two layers of prunes to be put into the bottom of the boxes, flattened and placed in regular rows, after which more prunes are packed on top of this facing and after the bottom is nailed on the box is turned over, and when opened is opened on the faced side, making a beautifully arranged display of faced prunes. About half to two-thirds of the prunes this year were sold faced. This part of the operations of the Salem Fruit Union's plant alone necessitated the employment this fall of from one hundred to one hundred and twenty-five women for a period of about two months. The total pack through their Salem warehouse this year will amount to about two and one-half million pounds, in addition to which they handled about one and one-quarter million pounds in other parts of the Willamette Valley.

Going back to the processing operation, this is done by putting the prunes through a long box or barrel-shaped machine, and turning live dry steam on them. In this machine there are boiling-water sprays, which clean the prunes so well that it is impossible to get your hands soiled in handling them when they come out of the processor. This operation requires a great deal of care in order not to get too much moisture into the prunes; otherwise they will not keep. The main idea is to get enough heat into the prune to thoroughly sterilize it, and just as little moisture into the fruit as is possible to do so. The gain in weight, due to processing, the past two years has been only about one and three-quarters to two per cent. The prunes are packed in 10, 25 and 50-pound wooden boxes, lined with nice, clean, white waterproof paper. 40,000 pounds gross weight has been the minimum car up to this season, but the minimum has been raised to 60,000 pounds gross weight this year.

Taking up the loganberry-juice business next, we will start with the berry in the loganberry yard, or vineyard

as it is sometimes called. The berries are allowed to get full ripe before picking, and as they are very perishable they are not allowed to stand long, but are rushed to the juice factory as soon as possible. The season for picking commences about the 20th of June to the 1st of July. They are picked in berry hallocks holding approximately one pound each, twenty-four hallocks to a crate, which is built single decked in order that by putting a screen over the tops of the crate the entire crate of berries may be dumped at one operation, saving handling of each hallock separately. The berries are then crushed and run into the press cloths and pressed. The juice is sterilized and put into storage. Later, as fast as sold, it is bottled, labeled, cased and shipped out to the trade. The manufacture of loganberry juice is a very delicate operation, and requires extreme care and cleanliness.

The canning of fruits is a business which requires a great deal of experience, and the details of this business are so intricate that a short delay or small oversight can do a great deal of damage. Fruit is usually put up in what is known as No. 2, No. 2½, No. 3 and No. 10 cans, and the grade is known as Special Extra, Extra, Extra Standard, Standard, Seconds, Water and Pie grades, according to the degree of syrup and quality of fruit put in the cans. After the preliminary operation of stemming, peeling, coring or other operation which it may be necessary for the fruit to go through, the fruit is washed thoroughly and the proper quantity of fruit for the size can to be canned is weighed into the can. The cans are then placed on an endless chain which carries them to the syruer, where the proper degree of syrup is turned on and the cans are filled. From here the fruit is automatically carried to the exhaustor, where live dry steam is turned on. There the fruit is thoroughly heated and the surplus air is driven out of the can, from which machine the fruit is carried to the capping machine, where the lid is crimped onto the can and sealed airtight. From this machine they are carried through the cooker, and the fruit is cooked the proper length of time in the sealed can. From the cooker it is automatically carried to the cooling tanks, where, after a short immersion, it is taken out to the cooling room and stacked, where it is left until it is to be cased up, at which time it is looked over carefully, and what are known as the "swells" are taken out. A swell is a can of fruit which, through imperfect sealing or improper cooking, was not sufficiently sterilized to keep, and when fermentation begins gases will form which press the lids of the can out, giving it a swelled appearance; hence the name "swells." As soon as the goods are tested for swells and cased they are ready for shipment. 40,000 pounds constitutes a minimum car. It is not generally known to the public, but is recognized by the canners, that the fruit produced in the Willamette Valley, Oregon, is of a very superior quality for this purpose. This

is not alone due to the fact that, on account of the particularly favorable climate, small fruits and berries grow to perfection in the Willamette Valley, but also on account of the greater intensity of the flavors in fruits grown there. From the fruit-products standpoint the Willamette Valley has a very bright outlook for the future.

Taking up the making of cider vinegar, the apples are ground and crushed and the juice pressed from them, the juice then being run into storage tanks for what is known as the alcoholic fermentation. After this is complete, which requires from 60 to 90 days, according to the temperature, the generating process is taken up. This consists of running the fermented cider through the generators or generating tanks, which are usually five feet in diameter and fourteen feet high, and are constructed with a false top and a false bottom filled with holes, through which the vinegar seeps. The spaces between these false bottoms and tops are filled with curled beat shavings, over which the vinegar runs, the purpose of these shavings and the false bottom being to expose the vinegar stock to the oxygen in the air, in which process the alcohol in the cider is converted into natural acetic acid. In Oregon the state law requires a four per cent acetic acid test. This is something known as 40-grain vinegar. In Washington the law requires a four and one-half per cent standard, or a 45-grain vinegar. Vinegar is sold on the percentage of acetic acid test, which is denoted as 40-grain for four per cent acetic acid, 45 grain for four and one-half per cent acetic acid, 50 grain for five per cent acid. After the vinegar has been put through the proper processes it is either bottled or put into barrels, according to the requirements of the trade, and shipped to the wholesale houses, who in turn ship it to the retailers as fast as required. The idea of a good vinegar maker is to produce vinegar that is a beautiful transparent yellow color, which will not precipitate a heavy sediment or cloud up in the bottle.

By way of summary, there are eighteen dried-fruit-packing plants in Oregon and Clarke County, Washington, and they handled the past year about 40,000,000 pounds of evaporated prunes, 750,000 pounds evaporated loganberries and a considerable quantity of other evaporated fruits and vegetables. I would judge that there is invested in these plants and their equipment \$275,000, and the total cash brought into the State of Oregon and Clarke County, Washington, by them this year amounted to approximately \$3,250,000. There are sixteen canneries operating in Oregon and Clarke County, Washington, and their total pack was 525,000 cases, valued at approximately \$1,250,000. Total capital invested in canning plants and equipment is a little out of my line, but I presume would not be less than \$300,000. I have included Clarke County, Washington, as it bounds Oregon on the north and is isolated from the rest of the State of Washington and a great proportion of



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To Preserve Strawberries

[Office of Information, U. S. Department of Agriculture]

SPECIALISTS in commercial handling and preserving of fruits in the Bureau of Chemistry, U. S. Department of Agriculture, have worked out the following accurate directions (which may be applied also to household conditions) for preserving strawberries so that just enough syrup of the proper consistency can be made in advance. With this amount of syrup the berries can be packed attractively without floating and no syrup will be left over, which in many cases means an important saving in sugar.

While the berries and syrup are cooking, place the empty clean jars and caps in tepid water and bring to a boil, and allow to boil for at least 15 minutes. Remove the jars from the water only as they are to be filled and the caps only when they are to be placed on the jars. Simply drain jars and caps; do not wipe them. One of the inexpensive jar lifters will be convenient in handling the hot jars. Do not boil rubber rings for any length of time. Just before placing them on the jars dip the rings for a moment into a quart of boiling water into which one teaspoonful of bicarbonate of soda has been added.

Strawberry Preserves. Recipe No. 1— Add 35 ounces of sugar to half pint of water, bring to a boil and skim. To this amount of syrup add exactly 2½ pounds of washed, capped and stemmed strawberries. Boil the fruit until it

registers 222 degrees Fahrenheit on a candy or chemical thermometer. If no thermometer is available, boil until the syrup is very heavy—about as thick as molasses. Remove scum from the preserves. Fill the sterilized jars full of hot berries. Pour in enough of the hot syrup to fill the jar, leaving as little air space as possible. Put sterilized rings and caps on at once, but do not fasten tightly. Stand the sealed jars in tepid water up to their necks if possible. Bring this water to a boil. Let pint jars stay in the boiling water for at least 15 minutes and quart jars at least 25 minutes, then close caps tightly at once. At the conclusion of the operation, stand each jar for a moment on its cap to make sure that the seal is absolutely tight.

Strawberry Preserves. Recipe No. 2— The following method is preferred by some because it leaves more of the natural color in the preserves. To two pounds of washed, capped and stemmed strawberries add 26 ounces sugar, let stand over night. In the morning pour juice thus obtained into a preserving kettle, add berries and cook to 222 degrees Fahrenheit, or until the syrup is very heavy. Pack and sterilize as in recipe No. 1.

Importance of Thermometer in Preserving—The preserving specialists advise those who are going to put up any quantity of preserves to purchase a chemical thermometer which gives

readings by degrees Fahrenheit for each degree from 212 degrees up. Equipped with such a thermometer, the preserver can be certain of uniform results. The syrup will not reach 222 degrees Fahrenheit until it is cooked enough and is of the best preserving consistency. The reason for this is that the syrup will not reach this temperature until the proper amount of water has been driven off by boiling. Such a thermometer is also very useful in all forms of preserving, in candy making, and in other cooking operations where results depend upon exact heating.

The following tested recipe for preserved strawberries is used in the boys' and girls' club work in the Northern and Western States: Make a syrup of 1 quart of water and 11 pounds of sugar and cook in an open kettle until a candy thermometer registers 265 degrees when placed in the syrup. Add eight pounds of berries to the syrup. Cook very slowly, just at the boiling point. Stop the cooking when the thermometer registers 219 degrees and pour into shallow pans to cool. Hasten cooling by pouring syrup over berries. Skim while cooling. Fill into jars when cold and allow to stand unsealed for four days. Put rubber and cap in position, not tight. (Cap and tip, if using enameled tin cans.) If using a hot-water bath outfit, sterilize 20 minutes; if using a water-seal outfit, or a live-pound steam pressure outfit, or a pressure-cooker outfit, sterilize 15 minutes. Remove jars. Tighten covers. Invert to cool and test the joint. Wrap jars with paper to prevent bleaching and store.

Added Honey Production Will Materially Relieve Sugar Shortage

Every beekeeper has an opportunity to "do his bit" by increasing his number of hives and seeing to it that every colony is in first-class condition. The unfavorable season has, in many instances, caused a depletion of stores to such an extent that brood rearing has practically ceased in the colony, and in such cases it may be advisable to do a little stimulative feeding to get brood rearing started at once. It will be possible, through the Oregon Beekeepers' Association, and also through the Oregon Agricultural College, says Professor Lovell, Entomologist at O. A. C., to get assistance in marketing the crop through the U. S. Department of Markets. The possibility of an overproduction is groundless and there is a real need for every extra pound of honey that can possibly be produced. Beekeepers are urged to write to Oregon Agricultural College, Corvallis, for advice in regard to beekeeping and to advise the college that they are working toward a heavy production this year.

"You farmers buy a good many gold bricks, eh?" "Yes, and you city fellers buy a good deal of swamp land. I guess things are about even." — Louisville Courier-Journal.



PROOF that Blasting the soil pays fruit growers

EVIDENCE

"In preparing the ground for the planting of trees the *Rural Press* recommends the use of powder." **PACIFIC RURAL PRESS, San Francisco.**

"We advocate the use of explosives for loosening up compact soils and hardpan in tree planting, knowing the value of such work." **FANCHER CREEK NURSERIES, Fresno, Cal.**

"The use of a good explosive is of great benefit in planting an orchard, as the ground should be loose enough to allow roots to go to their natural depth easily." **BENEDICT NURSERY CO., Portland, Ore.**

"We favor blasting holes for trees where the soil is heavy. Powder will loosen the soil, giving it a better chance to become aerated, as well as making it more retentive of moisture." **OREGON NURSERY CO., Oreg., Ore.**

"My orchard has made excellent growth, due to the fact that I used dynamite, breaking up the soil and making excellent beds for the roots. If I were to set another orchard I would not think of doing so without blasting each tree hole." **T. A. JOHNSON, Boise, Idaho.**

"We have used explosives in digging tree holes in the hard taliche subsurface layers which occur here. We find this cheaper than the use of pick and crowbar, and more satisfactory in that the soil is shattered deeper than the hole could be dug." **GEORGE T. FREEMAN, Arizona Agricultural Experiment Station, Tucson.**

"The use of Farm Powders in the orchard industry is rapidly being learned and appreciated. The worst looking orchard I ever saw, suffering from a lack of drainage, was blasted two or three years ago, and now it looks as fine as any other well kept orchard in this valley." **E. H. SHEPARD, Publisher "Better Fruit," Hood River, Ore.**

"We have observed many cases in which powder has been used for blasting beds for fruit trees, invariably with great success. The use of explosives is of material benefit when the soil is inclined to be rather shallow and underlaid with a hard subsoil. There are few soils in which blasting cannot be done profitably." **THE FRUIT GROWER, St. Joseph, Mo.**

"I have done a great deal of orchard planting and use powder for making the holes. At first it was used chiefly on heavy hardpan or other soils that were difficult to prepare with the spade, but is now used on all classes of soil. I have been planting trees even in light soil, easily handled. I should prepare all the holes with powder. Trees so planted make extraordinary growth." **FRANK FEMMONS, Oakhurst, Cal.**

"Generally speaking the growth of plants depends upon the condition of the soil into which the roots penetrate. If the depth of loose soil is too limited or the surface water is permitted to stand too long, the growth is impaired. Explosives properly used in such instances have invariably relieved the condition and resulted in excellent growth. The yield is often three times as great on blasted soil as from those untreated in the same vicinity." **ROSECROFT NURSERY & FRUIT FARM, Sumner, Wash.**

"The O'Connor prune orchard near Los Gatos in the Santa Clara Valley, California, was blasted in 1913. During the previous six years the largest crop was 3,900 pounds. In 1914 after the blasting, the crop was 8,000 pounds, more than double. It was a dry year, too. Where there were from 30 to 40 per cent. of drops in the orchards on both sides, the O'Connor place lost only about 5 per cent. Prunes from the blasted orchard averaged much larger and the trees made a better growth and retained their foliage a month longer than the orchards on either side." **JOHN A. GALPIN, Los Angeles, Cal.**

"My orchard was planted three years ago and all trees were of even age and size. I intended to blast the whole orchard but ran out of powder and finished the small balance without it. This enabled me to compare the growth of the trees and satisfy myself that the expense was justified. The trees that were planted in blasted ground show a growth of 75 to 100 per cent. over the trees that were planted in ground not blasted. They also appear healthier and more satisfactory in every way. I have just bought 1100 more prune trees and would not think of planting them without preparing the ground with powder." **HERMAN H. SMIDT, R. 3, Oregon City, Ore.**

is given by many fruit growers in the accompanying page from the Giant book, "Better Orchard Tillage." These men say that blasting

- enables the trees to root deeper;
- adds moisture storage capacity;
- saves labor and money;
- improves orchards that are not doing their best;
- is always profitable when properly done;
- places the soil in the ideal condition that permits newly planted trees to make extraordinary growth;
- increases the yield of fruit.

Scores of the most successful fruit growers in the Pacific Coast States plant all of their trees in beds blasted with one of the

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—Eureka Stumping Powder or Giant Stumping—both of which are made especially for this and other agricultural work. They have found these Giant Powders particularly well adapted to subsoiling and for blasting tree beds.

Some kinds and grades of explosives tend to shatter and pulverize anything they come in contact with. They act too quickly. These ordinary dynamites do not do the work well and cost more. Eureka Stumping Powder exerts its strength slowly, comparatively speaking. It tends to disrupt, crack, split and heave the soil and it extends its influence over a wide area. It loosens and pulverizes the soil instead of packing it and throwing it high in the air. This is the action that is wanted in soil work and this action the "high percentage" dynamites will not give.

Warning Giant Powder is the trade name of explosives manufactured by the Giant Powder Co., Con. Because Giant Powders are best known everywhere, many have assumed that all high explosives are Giant Powders. Insist upon having the genuine, made only by The Giant Powder Co., Con. If your dealer has only ordinary dynamites, write us and we will see that you are supplied with real Giant Powders.

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Remember that you can blast whenever the soil is dry, from a day to a year before planting time. Many growers keep Giant Farm Powders always on hand.

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Prepared especially to tell the facts about blasting soils for orchards and in orchards of the West. It tells how to secure the proper sub-irrigation conditions by blasting. It explains how blasting promotes drainage and increases both moisture-storage capacity and fertility. It gives detailed directions for preparing the soil for tree planting or for deep cultivation of established trees. We will send a copy free on request. Tell us about your problems and mark and mail the coupon. Other books on Ditch Blasting, Boulder Blasting, Subsoil Blasting for all farm crops, and Stump Blasting will also be sent on request. Ask for the books that interest you.

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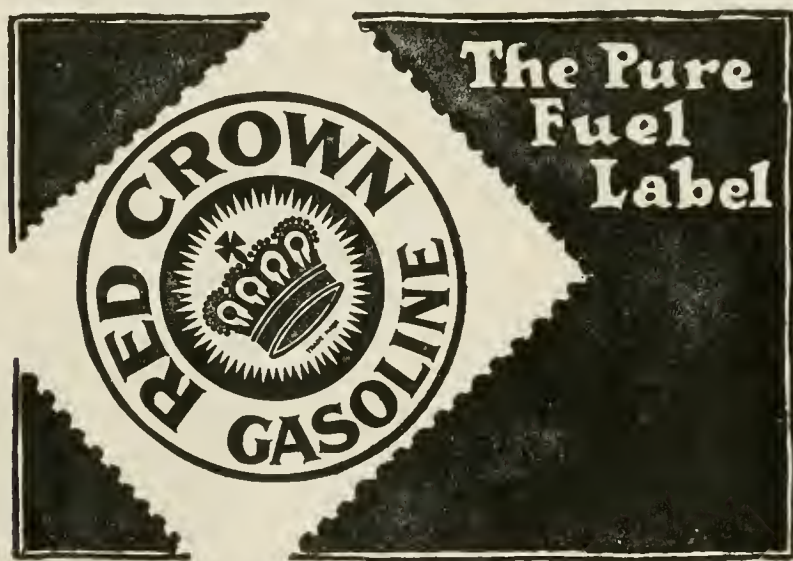
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Preparedness for Winter Food Supply Bulletin

By Dr. Ernest W. D. Laufer, Agronomist American Steel and Wire Company

GR^EAT and momentous times are for the first time since the Civil War again confronting the nation. The resources and savings of years of peace are again being pledged to the prosecution of war, more gigantic and more relentless than any war that has been fought in the history of mankind. Not all of us are chosen, however, to fight this great war with gun and saber, or by blood purchase, some must stay behind to pledge all that they possess in the effort to produce enough food to keep the valiant soldiers fed and their babes and wives at home from starvation. Our beautiful land of unlimited resources must be made to show its prowess in agricultural production, so

that none within her boundaries shall feel the pangs of hunger and the degrading influence of poverty.

Citizens and countrymen, it is your solemn duty to produce and conserve all of the food that it is possible to produce and conserve. No matter how small the garden or how tiny the number of pounds saved from waste, concerted effort will produce a potential weapon against our most dangerous enemies, hunger and food riots. In choosing what things to grow in the garden, it should be borne in mind that the crops to be consumed at once, such as lettuce, radishes, melons, etc., are to occupy the most limited space, while crops that can be dried, cooked, steam

processed, or cellared should be grown as abundantly as possible. The vegetables that are most readily preserved by cooking or steam processing are peas, sweet corn, tomatoes, spinach, Swiss chard, and cucumbers. Beets, carrots and string beans may also be put up in this way, either pickled or in brine. Rutagas, turnips, celeriac, parsnips, as well as carrots and beets, may simply be placed in a cool cellar (the temperature of which should not be kept higher than 40 degrees Fahrenheit), in bins of dry sand, where they will retain their usefulness until the late spring. Cabbages, Chinese cabbage, Brussels sprouts, and kohlrabi may be placed in the cellar with the heads down and covered with sand, taking care that they do not touch each other, but that each is entirely surrounded with a layer of sand. String beans and cabbage may, of course, be preserved by the fermentation method in the form of sauerkraut. Parsley, sage, thyme, marjoram, summer savory, basil, and celery leaves should be dried in a cool room, preferably dark with an abundance of circulating air. For this purpose they should be spread on newspapers in thin layers and turned frequently, or they may be tied in small bunches and suspended from a line until thoroughly dry when they should be packed in airtight boxes, such as baking-powder tins, etc. In gathering cabbages and the above herbs, care should be taken that they are free from dew and other moisture, as this would cause moulding and rotting. Okra or gumbo is not much known in the North; however, it makes an excellent and nourishing addition to soups and tomatoes; this can be dried by cutting into quarters lengthwise and subjecting to sunlight or other gentle heat and plenty of air. The same is true of sweet corn, which must be cut from the cob and dried as rapidly as possible. If this corn is soaked for several hours and boiled in milk with a little piece of butter with pepper and salt added, it is quite equal if not superior to canned corn. Parsnips may be left in the ground all winter and used in the early spring before growth commences; they will be found more tender and delicious at this time on account of the freezing they passed through.

All of the vegetables and herbs mentioned are of the easiest culture, requiring only medium quality soils to produce fair crops; they should be kept free from weeds and constantly cultivated, any special fertilization or cultivation will be well repaid, however, by heavier yields and more tender products. Weeds in fence corners and out-of-the-way places should be treated by spraying with sulphate of iron, Atlas A or Eureka weed killer. This should be made a community proposition, as concerted action is needed to insure results. Close attention to the above outline will result in a vastly increased food supply during this coming winter, besides furnishing the table with a number of delightful dishes which have only too often been absent in the American household.

National Congress of Horticulture Effected

By E. R. Lake, Secretary American Pomological Society

AN organization under the above name was effected in Washington City, November 17, 1916. The event was the outcome of a meeting called by the American Pomological Society. During the past four or five years some members of this organization have sought to modify the character of the activities of this old and venerable organization. For the purposes of determining the sentiment of the society upon this point, and of ascertaining the views of the state societies regarding federation and national and interstate problems, the executive committee of the society invited those interested to meet as above.

After an extended discussion of two days, during which Dr. L. H. Bailey made a quiet and telling appeal for the maintenance of a high-class amateur association, the real sentiment of the substantial element of the American Pomological Society membership, it appeared evident that there was a determined desire to organize a strong central body to serve as a clearing house for national, international and interstate problems, legislative and commercial questions; and further, to serve as an active agent in the collection and dissemination of scientific, statistical and economic data in so far as such touch upon the development, promotion and progress of American and foreign horticulture. The temporary organization effected, steps were taken to prepare a program of

work for the next six months, as follows: Constitution and by-laws; articles of incorporation; publicity; soliciting membership from state horticultural societies and other bodies; and establishing an official organ.

The depth of interest with which the movement was received by those participating may be indicated by the alacrity with which seventy-five per cent of them subscribed to charter membership at a fee of five dollars. Those present who were familiar with previous preliminary organizations of such bodies said that nothing like the anxiety to subscribe and pay up was ever seen before—a bright and auspicious omen from their viewpoint. Among the first members enrolled in this comprehensive body are the representatives of the Augusta County Fruit Growers' Association, Virginia; Connecticut Pomological Society; Eastern Fruit Growers; Minnesota Horticultural Society; National Apple Growers; North Carolina Horticultural Society; Northern Nut Growers; Pennsylvania Horticultural Association; South Dakota Horticultural Society; Virginia Horticultural Society; Wisconsin Horticultural Society, and individuals. The presence and activity of the representatives of leading state horticultural societies is evidence that these organizations, which are chiefly pomological, are to be the leading factors in the early promotion of this movement. The preliminary steps are looking to the establishment of an organization of from 50,000 to 60,000 members, ultimately to include every paid-up member of all horticultural organizations in the United States. The active voting membership to consist of delegates appointed by the affiliating bodies on a basis of something like one delegate for each one hundred members.

This scheme in its entirety contemplates a real or actual congress meeting annually and having an active voting membership from five to six hundred, with a corresponding attendance at its sessions, which would be business meetings for the discussions of the big interstate, national and international fruit, flower, vegetable, ornamental, seed and plant problems of these United States. There is no denying that the movement is fraught with tremendous possibilities. How successful the effort will be depends quite largely upon the degree of support given it by the state horticultural societies and associations. If these bodies can see as clearly as the leaders in the movement appear to, where and how an organization like this can aid them there should be no question that 1918 will see a very active and promising Congress of Horticulture. A synopsis of the preamble, tentative program, objects and organization of the Congress will be submitted to the state horticultural societies at their forthcoming meetings.

The spirited declaiming of Lupton, the insistent action of Crandfield, the placid but forceful assertions of



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Latham, the disquieting meaty questions of Massey, the fitful discourses of Hutt, the stories of Littlepage, the fiery accusations of McCue and the "acquiescence" of McComb, were fruitful features of the occasion, while a box of "Red-Skin" Jonathans did royal service as a peace factor. If further information relative to this movement is desired, it may be obtained by addressing the Secretary, National Congress of Horticulture, Washington, D. C.

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of Congress of March 3, 1879.

Fruit is Food.—A great many fruit-growers became seriously alarmed,—and perhaps there was a reason for being so,—over the possibility of fruit being classed as a luxury on account of the serious food condition existing due to the world-wide war. However, a great many, although they did not feel perfectly easy, felt quite certain that the government would not declare fruit a luxury. To do so would have created disaster in the fruit sections throughout the Northwest and Pacific Coast, many of which are dependent on the fruit industry alone. Undoubtedly in many other sections of the United States where fruit is grown extensively, although it may not be exclusive, fruitgrowers and farmers might not be able to continue. However, the government has shown its usual good judgment in the present crisis and has declared fruit a food, acting wisely in so doing for many reasons—because fruit is a necessary part of a balanced ration, a ration that everyone is accustomed to and cannot very well do without. This is especially true with all people who work in offices or whose work is not real physical labor; and it may be said in addition that many thousands of people who are dependent entirely on the fruit industry would have faced ruin if fruit had been declared a luxury and an embargo placed on the railways from handling it.

Evaporating and Drying Fruits.—So many millions of people are engaged in war in Europe that millions of men have been withdrawn from the ordinary fields of productivity. Europe has always consumed immense quantities of dried and evaporated fruits from America, and the need will be greater this year than ever before. Europe will be drawing heavily on America for many kinds of dried fruits, conse-

quently by evaporating and drying goodly quantities each grower can help out the food situation. Every fruit-grower should dry and evaporate enough fruits for his own use and in addition as much more as it is possible for him to care for, for the prime reason it will be needed, and for the further reason it will command a good sale at fair prices.

Vegetable Gardens.—While everybody is planting potatoes, fruitgrowers and farmers should not forget there are many other vegetables like carrots, onions, cabbages, etc., that keep well during the winter if properly stored, and if you have not already planted a sufficient diversity you should do so before it is too late, planting so they will mature before winter. Parsnips, a most delicious vegetable, can be left in the ground all winter and dug whenever wanted. Another fact that should be borne in mind in most districts where irrigation water is plentiful, fruitgrowers can continue to make plantings of many kinds of vegetables every two or three weeks, keeping a continuous supply throughout the season.

Fruit for Food.—The fruit industry has certainly been given the recognition due it by the United States government, classifying fruit as a food instead of a luxury. Fruitgrowers should show their appreciation by doing everything in their power to produce as large a crop of fruit this year as possible and to produce as clean a crop as possible, packing it in good standard grades, true to name, so the purchaser and consumer can depend on what he is getting. If the fruit-growers will do their "bit" in their own industry they contribute a large supply of food to the world.

Boxes, Baskets, Crates, etc.—The increasing cost of containers for all kinds of fruits is becoming serious and the fruitgrowers who postpone purchasing until too in the season may be unable to get a sufficient quantity. On the other hand, prices may advance very materially. One thing is quite sure, prices will probably not decrease below the present figures; therefore it seems good judgment for the fruitgrower to place his orders for what containers he will need during the season, hauling them to his packing house as early as possible.

Canning Fruits and Vegetables.—The government realizing, because it has information more fully than the public in general, the food condition, not only of the United States but of the world, is doing everything possible in the way of stimulating, preparing and encouraging people to increase production and warning them against waste. The government realizes that canned fruits and vegetables are a great source of food during the winter months, so the editor of "Better Fruit" earnestly urges every fruitgrower to put up a good supply of

canned foods, enough for your own use, and if you are prepared and equipped to do more, do so by all means, as there is no question but what all you will put up will be needed, and you will find a ready sale at good prices.

Tractors.—Every day the tractor is becoming more popular on account of its efficiency and economy. The increasing prices of hay and feed has been a big factor in directing attention to the tractor, and as a result more tractors have been sold, and farmers are rapidly finding out they do the work at a great deal less cost and a great deal quicker. So great is the demand for tractors and the use of tractors at the present time that many have equipped their tractors with ample lights so that cultivating can be done at night time, thus enabling one tractor to do double the amount of work.

The Liberty Loan.—By the time the June edition will have reached our subscribers the date for registration, June 5th, will have passed and 500,000 will be accepted. However, many will register who will not be called on at the first call. All these and many others not within the age limit, or those who do not go on account of physical reasons, and various other reasons, can do their share and help the government in the present crisis by subscribing to the Liberty Loan, as the bonds are arranged in very small amounts on very easy terms, making a satisfactory investment. Everyone should do his "bit" for his country at the time when it is needed.

Bees.—The increased price of sugar makes the bee an important insect at this particular time. Sugar is a necessity for a balanced food ration. The price of sugar is very high and fruit-growers, by maintaining a few hives of bees at no cost, can put up a lot of honey for winter use, which will provide the necessary sugar and save considerable money, as sugar is already high and probably will be higher. In addition to this by maintaining a few hives of bees, supplying sugar for your own family, and possibly some to sell, you won't be drawing from the already limited supply on hand, which others need, who live in the city and cannot keep bees.

Attention, Fruit and Vegetable Growers

CAN your Fruits, Vegetables, Meats and Fish in Sanitary Cans, with the H. & A. Steam Pressure Canning Outfits, built in Family, Orchard and Commercial size; seal the cans with the H. & A. Hand or Belt Power Double Seamer; they will save your perishable fruits and vegetables at ripening time when nothing else will. Write for descriptive matter.

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No crushed fruit if you use the **Barnett Fruit Picking Pail.**

Information on our Orchard Supplies will be gladly given on request.



N. W. Fence & Supply Co.

Station A

Portland, Oregon



The Rhizoctonia Disease of Tomatoes

[State Agricultural Experiment Station, Pullman, Washington]

THE disease of tomatoes known in the Northwest under various names as blight, yellows, yellow blight or western blight, is due to the sterile fungus, *Rhizoctonia*, which lives upon the roots of the affected plants. According to the Pathologist of the Experiment Station, the symptoms and effects of the disease are as follows:

1. The aerial parts of the plant: Dwarfing or reduction in size of the entire plant; the production of the rosette type of growth; discoloration of the foliage; curling or rolling of the leaflets; reduction in size of the fruit and premature ripening or failure to set any fruit; wilting and death of the entire top.

2. On the roots: A network of brown fungous filaments upon the surface of the roots; the occurrence of black nodules or masses (scleroti) at various points upon the roots; the presence of dead corroded areas (lesions) upon the roots or basal portion of the stem; the death of roots from the tip backward; an abnormal production of adventitious fibrous roots.

The parasite is present only on the

roots or basal portion of the stem and the symptoms shown by the foliage are only an indirect effect of the parasite. The disease may be barely evident or sufficiently severe to kill the affected plants. The same fungus causes the "damping-off" of seedlings.

Control: The habits of the causal fungus must be taken into consideration in methods of control. *Rhizoctonia* is common in many soils and attacks many wild plants and cultivated crops. It has been noted in Washington during the past two years as the cause of serious disease in potatoes, beans, beets, peas, cucumbers, peppers and strawberries. Infected seed potatoes are undoubtedly responsible for many cases of serious soil infection.

Cultural practices must be resorted to in the control of this disease and the following suggestions are offered for the guidance of growers:

1. Use clean soil free from *Rhizoctonia* for the growth of tomato plants if they are to be transplanted, or if the soil is infected use some method of sterilization.

2. Avoid ground upon which potatoes have been grown during the past four or five years. Give attention to the possible occurrence of the disease upon some other crop that might have infected the soil. Cereals and other grasses are never attacked by *Rhizoctonia*.

3. Practice a culture that will supply the growing plants with an abundance of moisture. Lack of moisture in-



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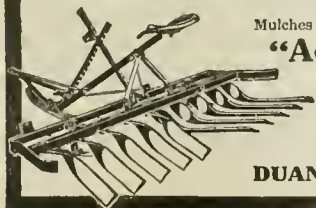
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in business who does not back his convictions with his own means has a hard job convincing others to put their money on his judgment.

During the past winter it appeared certain to us that there would be a marked scarcity of raw materials entering into the construction of our

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increases the severity of the disease since the fungus is constantly cutting down the supply of absorbing roots, and so making it more difficult for the plant to obtain sufficient water. Good cultivation for the aeration of the soil is also an important factor.

4. Use a liberal amount of fertilizer (barnyard manure) so as to stimulate the growth of the plants, and if the soil is known to be acid use lime also.

5. In transplanting to the field do not set the plants too shallow. Deep setting gives a greater opportunity for the development of adventitious fibrous roots to take the places of those killed by the fungus. It may even be advisable to set the plants in shallow trenches and gradually fill around them with successive cultivations.

6. Growing the plants in the field to avoid transplanting is sometimes of value. Injury to the root system in transplanting does not allow the entrance of the fungus, but retards the development of the young plant without affecting the advance of the fungus. Carefully transplanted plants that suffer little or no check in their growth are more likely to keep ahead of the fungus.

7. In case a soil infection of a field is suspected, early fall plowing with frequent cultivation is suggested. It seems probable that the aeration of the soil by frequent cultivation lessens the amount of the fungus that will remain alive. Some growers have used this practice with excellent results.

Cherry Gummosis

A question as to the cause, cure and prevention of gummosis in "Möllers Deutsche Gärtner Zeitung" brought forth the following reply from Mr. R. Muller of Gotha, Germany, in its issue of October, 1914. Mr. Muller's studious and practical experience of many years' standing in cherry-tree culture lends peculiar weight to his observations and suggestions. He writes: "After many years of practical experience with the problem of gummosis I am of the firm opinion that gummosis is not an indication of sickness of single parts of the tree. Even if wounds, bruises and frost injuries may be considered accountable factors, still, I believe, the

causes must mainly be sought for in disturbances of the nourishment of the tree, just how is still not clear to us. They are, perhaps, mainly to be traced to the condition of the soil. In my work for over thirty years as manager of a tree nursery I have from the beginning accepted a surplus flow of sap as the prime cause of gummosis, and this the more as always the thickest and strongest limbs suffered peculiarly from it. As the soil condition of the nurseries varied much it was not possible always to locate our cherry quarters on identical land. However, we always chose such locations as had received no stable manure for a period of at least two years, but which had previous to being planted with seed-

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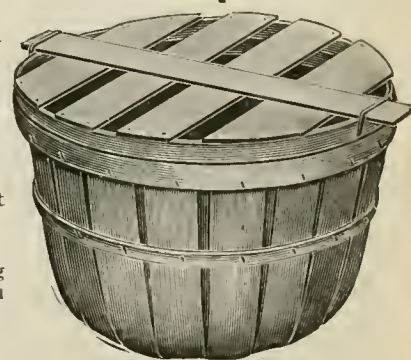
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Two men, one an **experienced machinist**, the other an **experienced cabinet maker**, with many years' practical experience in the fruit industry in Hood River, combined their **mechanical skill** and practical knowledge of fruit handling in perfecting a **grading machine**—a **model of simplicity, economy and efficiency**.

There is no machinery—Nothing to get out of order or be fixed connected with the Ideal Fruit Grader. It is practically all wood.

The operation is simple, consisting of a belt for a conveyor, operated by electricity or gasoline engine, and short elastic belts, which move each apple in the proper bin from the belt conveyor.

The Ideal Fruit Grader divides the crop into Extra Fancy, Fancy and C-grade, all at one time. The Extra Fancy being divided into seven bins on one side, the Fancy into seven bins on the other side and the C-grade going into six bins at the end of the grader.

Built for four sorters, the grader is 28 feet long and 10 feet wide; built for eight sorters, 32 feet long.

In 1916 we packed 9,000 boxes with the Ideal Fruit Grader with two packers without the machine ever stopping once for repairs of any kind. Further detailed information, illustrated circulars and prices will be furnished upon request.

IDEAL FRUIT NURSERY CO.
HOOD RIVER, OREGON

lings, been richly supplied with compost dirt, to be plowed under. Where a sugar refinery is handy I would recommend the use of lime which when worked into the compost heaps gives excellent results, particularly so on heavy clay soils. I consider the direct application of lime dangerous, as one place might easily get too much and injure the roots. Cold, non-porous, or even wet land is unsuitable for cherry culture. By my selection of seedlings I look less to size of trunk than to strength of root system.

When the cherry trees are young I have had success in healing by tapping or bleeding. To cut out the places of flow, to paint them with grafting wax, or to bandage them tightly, I regard as purposeless. Gummosis will always find new outlets. In bleeding, however, I consider a frequent softening up and washing off of the protruding sap beneficial as it furthers the healing of the wound. Sour cherries that have been grafted on sour-cherry stock are less subject to an attack of gummosis both as small nursery trees and also later as bearing trees. Older sweet cherry trees are seldom entirely free from gummosis, but may nevertheless live for many years and bear abundant fruit. This has been my experience at Praust. Here I found a fine cherry orchard about thirty years old which, despite a favorable location and good soil conditions, numbered many trees that were suffering from gummosis, so much so that the gum flow was gathered and used in place of dextrin as paste

for envelopes, etc. Now after nearly thirty years many, of course, have succumbed, but up to a few years ago when I retired many were still bearing satisfactorily. One row of trees on ridge covered with sod and planted in marly clay soil was practically free from the disease. I may add that in the places where old trees had died no young tree, however healthy when planted and despite a change of soil, would ever thrive. In their place we planted seed-fruit trees."

Only Tree-Ripened Fruit is Perfect

There is but one really great chemist, Nature. Man knows a lot about chemistry, more and more every year, and he is learning that only ripe fruit is of the highest quality. The easy plan of picking apples, bananas and oranges when the fruit is half ripe and allowing it to become fit for use while in transit from the tree to the table has been abandoned or should be abandoned in every well regulated producing district. Only fruit ripened on the tree can be of highest quality on the table.

Apple growers in the Hood River district of Oregon have learned the lesson in chemistry, the lesson which means so much to the consumer of fruit. To get the bright coloring of the Hood River apple the fruit must remain on the tree until it is fully ripe. To gain the delicate flavor and the proper amount of sugar the fruit must remain

in the sunshine to the last minute, must be allowed to take from the tree the last bit of nourishment and from the air the nectar which the bee takes from the flower. The combination of fresh air, sunshine, iron in the soil, mountain breezes, perfect pruning and thinning,

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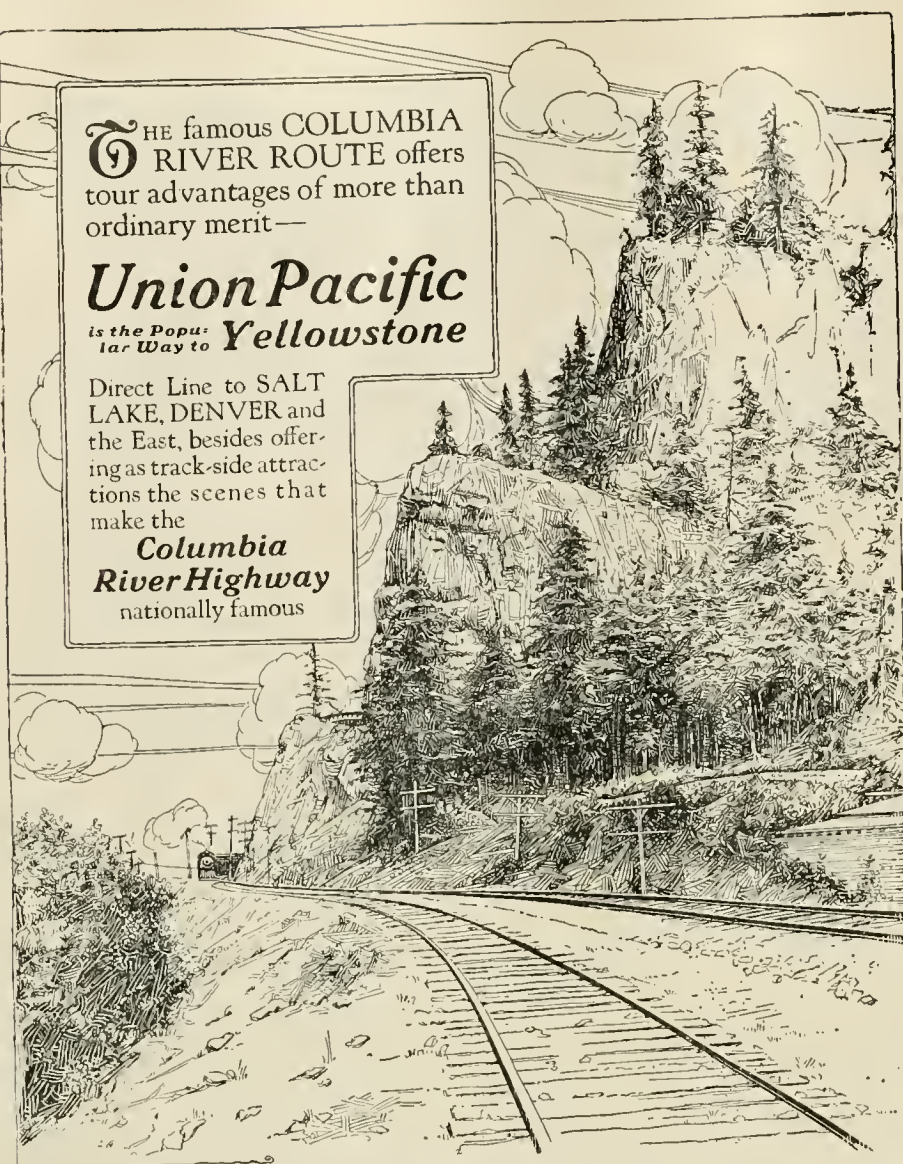
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1917 Tourist and National Park Season begins June 20th.

Sale dates June 20-30, July 3, 4, and Fridays and Saturdays thereafter up to September 29. Return limited to 3 months, but not later than October 31, 1917. Denver, \$62.50; Omaha, \$67.50; Chicago, \$80; New York, \$118.20; Washington, \$116. Fares to other cities, special dates, reservations, tickets and information upon application to

City Ticket Office, Washington at Third Street, or to Wm. McMurray, General Passenger Agent, Portland

gives to Hood River apples the most exquisite colorings, the most delicate flavors and the most uniform size.

Housewives are fast learning that only apples allowed to ripen on the tree, in the autumn sunshine, will give the delicate dishes desired, and they are more and more demanding the boxed and graded article, under guarantee of the Hood River grower, who is

bending every effort to produce the finest apples offered on the markets of any country.

Raw Vegetables Healthful

The various fresh vegetables which may be eaten raw or served as salads are always welcome in season. It is, however, difficult to classify plants according to their uses, because so many are served either raw or cooked. Generally speaking, salad plants may be classified as those whose leaves and stems are usually eaten raw with a sour dressing, and a salad is a dish consisting wholly or in part of raw or cooked vegetables served with a sour dressing which contains fat in some form. Raw green foods are valuable because they

are attractive in appearance and stimulate an appetite for the more substantial foods, and also because in this shape we retain all their mineral constituents which are liable to be partly lost in cooking. The vegetables most commonly used uncooked for salads are as follows: Lettuce, cabbage, celery, water cress, onions, cucumbers, radishes, carrots, kohlrabi, endive, chicory, sorrel, pepper grass and nasturtium seeds.

Delicious salads may be prepared from portions of vegetables that are frequently wasted in cooking. If the outer leaves of cabbage are used in a salad bowl, any adhering may be washed off and the leaves used in a scalloped dish or soup. The coarser stalks, white leaves and roots of celery should be used in soup stock, or the leaves may be dried and used for flavoring when celery is out of season. Green onion tops are good for flavoring soups, or may be cut into inch lengths, cooked and served with toast. These vegetables must always be thoroughly washed. The practice of cutting across the head of lettuce or celery should be discouraged, because it is practically impossible to cleanse the axis of the lower leaves. All such plants should be separated in their natural divisions and carefully washed through several waters. In preparing more than one head of lettuce at a time, sort out the coarser portions to be used in soup or greens. The next best parts may not be attractive enough to serve plain and should be shredded for combination with other material, while the heart of the lettuce may be served in the simplest way. Part of the lettuce may be put in a tin pail with a tight cover, or be wrapped in a piece of cloth, or be put in a paper bag, and will keep crisp until the next day. Greens should be cooked in salted boiling water ten minutes. Blanch in cold water two minutes, drain, chop lightly, and heat in stewpan with butter, salt and pepper. Serve with lemon juice or vinegar.—Sarah L. Lewis, Assistant Professor of Domestic Science, Oregon Agricultural College.

ORCHARD YARN

Listen, Orchardists: Now is the time to tie your fruit trees. All limbs can be readily seen; the spurs are less easily broken off than later; the saving of time is considerable and yarn is probably as cheap as it will be this season. **Orchard Yarn** is the correct method of supporting trees and the saving of a few trees is worth the cost of the yarn for an entire orchard.

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Nice Bright Western Pine FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH.

Manufacture of Fruit Products

Continued from page 7.

the fruit business done there is carried on by Oregon packers. During the past year the loganberry-juice industry has made big strides and there are now thirteen loganberry-juice factories, which manufactured about 500,000 gallons of juice and paid the growers about \$200,000. Total capital invested in plants, machinery and equipment approximately \$250,000. The total crop of loganberries in the state this year was approximately 5000 tons fresh berries, about seventy per cent of which was made into juice. There is at least one unfermented apple-juice factory in the state which put up quite a large quantity of unfermented apple juice. I understand their Olympia, Washington, plant used five or six thousand tons of cull apples this season. There are at least ten vinegar plants in the state, although there may be a few more with which I am not acquainted. I am not familiar with the details of this business, so cannot give any information as to output, money distributed or capital invested.

"Use Your Tractor"

"Help your neighbors" is the keynote of a special appeal to tractor owners issued today by Assistant Secretary of Agriculture Carl Vrooman. "Every farmer who owns a tractor," he says, "owes it to his country this spring to do all the custom or exchange work he can do without neglecting his own work. Every hour that his tractor would otherwise be idle it ought to be at work helping a neighbor who is behindhand with his plowing or harrowing. Make your outfit work from dawn to dark; make it work all night if you have enough operators to fill the shifts. The acreage to be harvested this fall hangs on the plow. Don't let an acre that might otherwise be planted go untilled because your tractor is in the shed. Help your neighbors and thus do your part in strengthening the allied lines on the battle fronts of Europe."

Cutting Out Borers Frees Peach Trees

Peach tree borers, the most destructive insects in peach orchards of Eastern United States, are best controlled by worming, or cutting the grubs out of their burrows with a sharp knife in late fall and early spring. Entomologists at the Ohio Experiment Station say that nearly all sprays and washes, as well as all mechanical protectors and barriers, are of doubtful value, some not paying for the cost of their application and others being positively injurious. During the winter the insect lives as a larva in a deep burrow under the bark of the peach tree a few inches below the soil level. With the warm days of early spring it feeds upon the tender growing tissues beneath the bark, causing the tree to become sickly and unproductive and often to die if a sufficient number of borers infest it. By early summer they construct cocoons, and in about nineteen days emerge as adult moths. These parents are clear winged and resemble certain

blue wasps. Although the female lives only four or five days, she lays about 400 fertile eggs in this time, and from these the larvae hatch in eight to ten days, or about July 1 to August 30. To kill the borers, remove the soil, when not frozen, from about the base of the trees. Exuding gum and "sawdust" will show the location of the larvae and thus they can be cut out with a sharp knife or probed with a wire. The earth should then be replaced around the tree and left until the middle of September, so that eggs will

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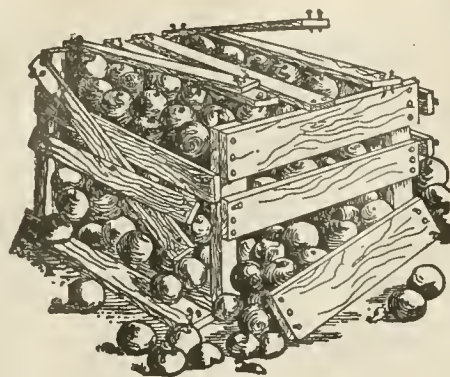
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MICA

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not be laid again in the formerly infested portion. A spray of one gallon of commercial lime-sulphur to eight gallons of water, with a pound of arsenate of lead paste and a little lime added, has reduced the number of borers when carefully applied in early June to the tree trunks and large branches, again in mid-July and later in early August. However, like other sprays, it has not been a complete remedy in experimental spraying tests against this peach enemy.—Ohio Agricultural Experiment Station Bulletin.



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

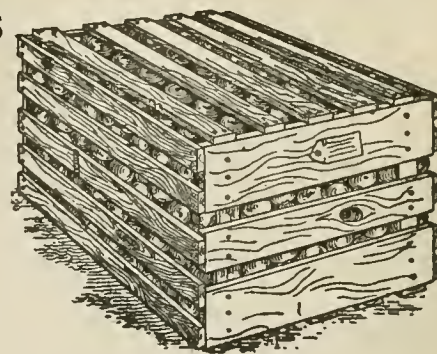
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Spray to Save the Fruit Crop from Insects and Diseases

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Specialists Advise Methods for Control of Moth, Caterpillars, Aphids, Scale, Curculio, Scab, Blotch and Rot—Treatment for Apple, Peach, Plum and Cherry—Spraying Schedules

By A. L. Quaintance, Bureau of Entomology, and John W. Roberts, Bureau of Plant Industry, U. S. Department of Agriculture

[Editor's Note.—The following article contains information pertaining to fruit diseases and pests and control, and will therefore prove interesting. However, some of the periods for treatment of the various diseases and pests have passed, but the bulk of the spraying is yet to be done during the balance of the year. It should be borne in mind, however, that the remedies and treatments are general, and therefore might not meet the requirements of some districts. The conditions in the Northwest are somewhat different from what they are throughout the East, so it seems wise to suggest to the growers that they do not deviate from their rule, which has proved successful in the past. It is also wise to suggest that where there is a difference or when the fruit grower is in doubt it would be wise to consult the State Experiment Station, the local horticulturist, the county inspector or some other well posted man in whom you have the fullest confidence. Attention is also called to the fact that in the East the delayed dormant spray for fungus has not generally been used, and it may be possible that it is not necessary, although it is generally considered in the Northwest in districts affected with fungus that the delayed dormant is a very important and necessary spray.]

FRUIT, either in fresh, dried, canned, preserved or jellied form is a food product of recognized value. The maximum production of good fruit at this time is, therefore, of paramount importance. Directly concerned in the production of such fruit are spraying operations for the control of various insects and diseases. Owners of commercial orchards have long recognized the importance of spraying, but there are many small orchards and so-called home orchards, the owners of which have not adopted spraying operations, or do not give sufficient attention to the work. The uncared-for condition of such orchards is too often revealed by the great number of wind-fall fruits and the inferiority of that which remains on the trees, the U. S. Department of Agriculture finds. No single feature of orchard practice yields so high a percentage of benefit as spraying, often increasing the value of the product several hundred per cent. Every fruit grower, large or small, has it within his power to save his fruit from loss by insect and fun-

gous pests, and thus add materially to the food supply of the nation. Spraying is now recognized by progressive growers as an exceedingly cheap form of insurance, not only protecting the fruit during the growing season, but insuring its proper keeping in storage.

SPRAYING THE APPLE

The apple is grown over a very large territory and is our most important and valuable fruit crop, and when properly sprayed and handled will keep in storage for months.

INSECT PESTS

The Codling Moth: The codling moth is the dirty white or pinkish caterpillar which feeds within the fruit, mostly around the core, resulting

in a large number of windfalls during the summer and in wormy fruit at harvest time. In the absence of treatments this insect will destroy each year a large proportion of the crop. Fortunately it yields readily to treatments, and a high percentage of benefit follows through spraying operations against it, as outlined in the apple-spraying schedule below.

The Plum Curculio: This little snout beetle attacks various fruits, as the apple, peach, plum, cherry, etc. Early in the spring the beetles puncture the little apples for feeding and egg-laying purposes, causing much of the fruit to fall, and the fruit which remains on the trees becomes knotty and misshapen as it grows. The curculio is notably worse in neglected orchards, as in

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IS an EFFICIENT and RELIABLE MACHINE which will lower the cost in your Packing House and relieve you from dependence on expert packers.

It has proven a good investment in scores of up-to-date packing houses during the past five years.

Order early if early delivery is desired.

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Cutler Fruit Grader Company
HOOD RIVER, OREGON

orchards which are in sod and more or less grown up in weeds and trash. In order to effect a satisfactory control of the curculio by sprays, these unthrifty orchard conditions must be corrected.

The Apple Maggot: This insect, often known as the "railroad worm," railroads or mines the pulp of the apple, making brownish patches or trails. Several maggots in the fruit will reduce the pulp to a filthy mass, merely held together by the skin. Its injuries are confined largely to the Northeastern States. Present evidence indicates that the apple maggot may be controlled by the application of arsenical sprays to the fruit and foliage during early July, and some observers hold that routine orchard spraying is effective in obviating important injury. Drop wormy fruit should be promptly collected and destroyed.

Apple Aphids: Principally three species of aphids attack the fruit and foliage of the apple, namely, the rosy aphid, the green apple aphid and the oat aphid. The rosy aphid is especially injurious to the blossom clusters and causes the fruit to become knotty and distorted or to fail to properly thin out in the clusters, resulting in undersized fruit. The oat aphid is of relatively little importance, though the green apple aphid may seriously check the growth of young trees during the summer when abundant on the shoots and foliage. These aphids winter on the apple trees in the egg condition, the young hatching as the buds are breaking in the spring. They are best controlled by the use of 40 per cent nicotine sulphate used at the rate of three-quarter pint to one hundred gallons of spray. If the treatment for the San Jose scale be delayed, the nicotine may be added to the strong lime-sulphur wash, effecting combination treatment for these two pests. The nicotine may also be added to advantage to the first scab treatment of the spray schedule.

Leaf-Eating Caterpillars: Various leaf-eating caterpillars, as canker worms, tent caterpillars and the like, are more or less abundant in orchards each year in different parts of the country. These caterpillars, as a rule, are kept well in check by the use of arsenical sprays.

Scale Insects: The San Jose, oyster-shell and scurfy scales are very generally present in apple orchards throughout the country. The San Jose scale is by all odds the most injurious and in the absence of annual treatments will destroy or greatly injure the trees. An individual scale is about the size of a pin head, and has a nipple-like prominence in the center. When abundant the scales literally incrust the limbs and branches, to which they give an

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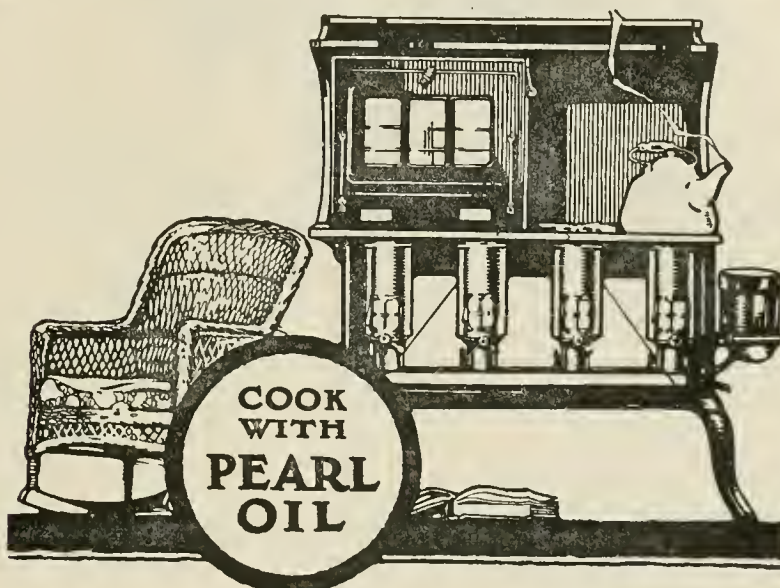
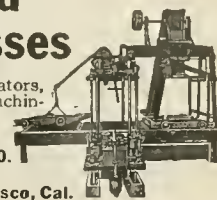
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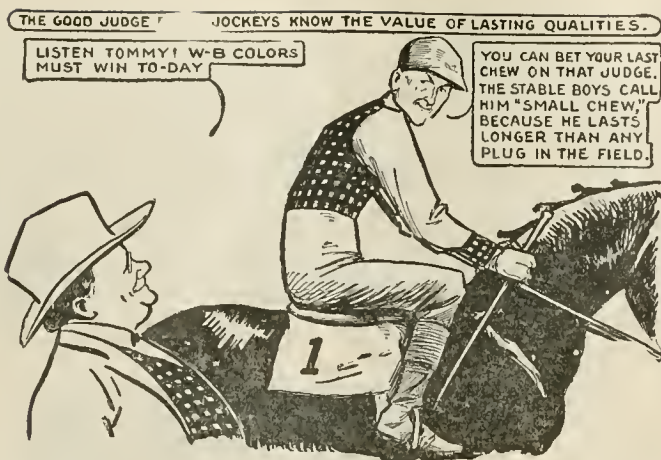
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ash-gray appearance. Badly-infested bark when cut into usually shows a reddish color. These scale pests are very successfully controlled by the use of strong sprays applied during the dormant period of the trees, as indicated in the schedule of applications.

DISEASES OF THE APPLE

Apple Scab: This is the most destructive disease of the apple and is almost universally distributed. It appears very early in the season and causes not only grayish or brownish unsightly spots on the fruit, but often causes cracking and dwarfing of the fruit. It also appears as black blotches on the leaves. It is a cool-climate disease and hence is most destructive in the more northern apple-growing regions. It is well controlled by spraying according to the methods outlined hereafter.

Bitter-Rot: Bitter-rot is typically a Southern apple disease, and in the regions in which it occurs it is one of the most dreaded. It does not appear until the weather has become hot, this date being usually about the first of July, and is one of the hardest of all diseases to control. The rotted spots, with the pink or dark-colored concentric circles of fruiting postules, are typical of this disease. The removal of limb-cankers and mummied fruits in which it lives over from season to season is an important aid to control by spraying. In the East Yellow Newtown (Albamarle Pippin) is especially susceptible to this disease. In the Middle West nearly all varieties are susceptible to some extent at least.

Apple Blotch: This disease begins in the early part of the growing season, but is not conspicuous until nearly mid-summer. It is distributed over the southern half of the apple belt and is to the South what the apple-scab is to the North. It is most destructive in Kansas, Arkansas, Missouri, Kentucky and Southern Illinois. It occurs on fruit, leaves and twigs, but is most destructive to the fruit. It appears on the fruit as an irregular brown spot with a hard roughened surface and a somewhat uneven margin. It grows very slow and finally becomes somewhat sunken. In severe cases, especially on certain varieties, the fruit may finally become badly cracked. Ben Davis, Missouri Pippin and Northwestern Greening are especially susceptible to this disease.

Sooty Fungus and Flyspeck: Toward the end of the summer apples may become covered with large sooty blotches or areas of minute black spots. These diseases do not penetrate the apple skin at all, but injure the market value of the fruit by detracting very greatly from its appearance. These diseases are quite common in the moister parts of the United States and in unsprayed orchards often cause considerable financial loss. They are, in ordinary seasons, controlled by the sprayings applied for the control of other apple diseases.

Black-Rot or Ring-Rot and Leaf-Spot: These diseases are caused by the same fungus, and are controlled by cutting

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Wouldn't You **Pay** a little more for a box of apples if you knew that it **Would Keep Longer**.

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out the branches and twigs, supplemented by the sprayings recommended for the other diseases. The applications recommended for scab-control will control the leaf-spot, and those recommended for bitter-rot will greatly lessen the losses from black-rot.

SPRAY SCHEDULES

Dormant Tree Spraying: During the dormant period of trees sprays may be used much stronger than at other times, and for this reason are especially advisable for the treatment of scale insects, blister mite, etc. Applications may be made after the leaves have fallen in the fall, during warm days in the winter, or in the spring before the new growth begins to appear. Where aphids are troublesome it is often practicable to delay the San Jose scale treatment until just as the buds are breaking, and by adding nicotine to the strong lime-sulphur spray effect a combination treatment for these two insects.

SUMMER SPRAYING

First Application: Use lime-sulphur solution at the rate 1½ gallons to 50 gallons of water plus 2 pounds or arsenate of lead paste (or 1 pound or powdered arsenate of lead) just before the blossoms open. This is for apple scab, the plum curculio, canker-worms, the bud moth, case-bearers and the tent caterpillar. Add one-half pint 40 per cent nicotine sulphate if apple red bugs are troublesome, and if apple aphids are much in evidence.

Second Application: Use same spray as in first application as soon as the blossoms have fallen. This is for the above-mentioned troubles as well as for the codling moth and leaf-spot. It is the most important application for both apple scab and the codling moth. In spraying for the codling moth at this time, the aim is to drive in the calyx end of each little apple a quantity of the poison, and, to accomplish this, painstaking work is necessary. Failure to do thorough spraying at this time for the codling moth cannot be remedied by subsequent applications.

Third Application: Use the same spray indicated above three to four weeks after the blossoms fall. This is the second treatment for codling moth and leaf-spot, and gives further protection against apple scab and certain insects. In orchards in which blotch has been prevalent this application should be made not less than three weeks after the blossoms have fallen. Where this disease has been severe, bordeaux mixture (3-4-50) should be substituted for the lime-sulphur solution.

Fourth Application: Use bordeaux mixture (3-4-50 formula) and an arsenical eight to nine weeks after the petals fall. This is the first application for the second brood of the codling moth and for bitter-rot. In orchards in which bitter-rot has been a serious disease this application should be advanced about one week.

Fifth Application: Use bordeaux mixture from two to three weeks after the fourth application. This is the second application for bitter-rot, and since it is very little extra expense to

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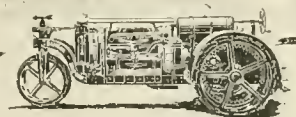
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add an arsenical, this may be profitably done as a further protection against late-appearing larvae of the codling moth.

Sixth Application: Use bordeaux mixture again two or three weeks after the fifth treatment has been applied. This is the third application for bitter-rot and is ordinarily sufficient to carry the fruit through, but on specially susceptible varieties in bitter-rot sections, a treatment to be made two weeks later may be found necessary.

Seventh Application: In severe cases of bitter-rot a seventh application may be necessary, and in severe cases of blotch an extra treatment midway between the third and fourth applications is sometimes necessary.

Note: In the more northern apple-growing sections the first four applications will, during ordinary seasons, be sufficient to protect the fruit from various insects and diseases mentioned. In the more central states, where bitter-rot and blotch are prevalent, the fifth and sixth applications will be necessary. In the case of summer apples, only the first three applications are necessary.

PEACH SPRAYING

There are four or five serious insect and fungous pests of the peach effectively controlled by spraying. Notwithstanding the fact that the larger commercial growers throughout the country have adopted measures for the control of these troubles, there is still room for much improvement on the part of many orchardists, especially those having small home orchards. Although successful spraying of the apple has been practiced for many years, it is only recently that sprays have been developed which are effective and safe for the tender foliage and fruit of the peach and certain other stone fruits. The development of the combination spray of arsenate of lead and the self-boiled lime-sulphur mixture has been of enormous value to peach growers, and its use has placed the cultivation of this crop on a much sounder basis than heretofore.

INSECT PESTS

The Plum Curculio: This insect, already referred to under the head of apple, is the cause of a large amount of injury to the peach. Aside from the injury which it actually does to the fruit, its attack much favors the spread and infection of the fruit by brown-rot fungus. Its control is therefore especially essential in connection with remedial operations against brown-rot.

The San Jose Scale: This insect, also mentioned under apple insects, requires treatment on the peach. Applications should be made while the trees are



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dormant, and if spraying be delayed to just before the buds are due to swell the treatment also controls peach-leaf curl. Winter strength commercial lime-sulphur solution is almost universally used in the case of the peach, since the fruit buds and twigs are more likely to be injured by oil sprays than is true of the pome fruits.

DISEASES

Leaf Curl: This disease affects the leaves of the peach, causing them to become reddened and curled. It begins quite early in the season and is easily controlled by the same treatment which controls scale insects.

Peach Scab: This disease is the ordinary black spot of freckles of the peach. It appears early in the summer and when several spots run together and infections are numerous it gives the fruit a smutty appearance. Severely infected fruits are dwarfed or misshapen, and are often cracked so severely as to cause dropping. This disease causes more loss to growers than is ordinarily realized because infected fruits so often fail to attain their normal size.

Brown-Rot: This is the ordinary rot of the peach which is so often very destructive at ripening time, and is the only peach rot of commercial importance. It is particularly destructive during warm, moist weather. Especially in the South it may sometimes cause the loss of practically the entire crop.

SCHEDULE OF APPLICATIONS

In the eastern half of the United States most of the peach orchards should be given the combined treatment of arsenate of lead and self-boiled lime-sulphur mixture for curculio, scab and brown-rot. The curculio and brown-rot are more especially troublesome in the South, whereas peach scab is worst in the Alleghany Mountain region and in the Northern States.

Midseason Varieties: The Midseason varieties of peaches, such as Reeves, Belle, Early Crawford, Elberta, should be sprayed as follows:

(1) With two pounds of arsenate of lead paste (or one pound of arsenate of lead, powdered) per 50 gallons of water, to which has been added the milk of lime, made from slaking three or four pounds of stone lime, about ten days after the petals fall, or at the time the calyxes are shedding.

(2) With self-boiled lime-sulphur mixture four to five weeks before the fruit is due to ripen.

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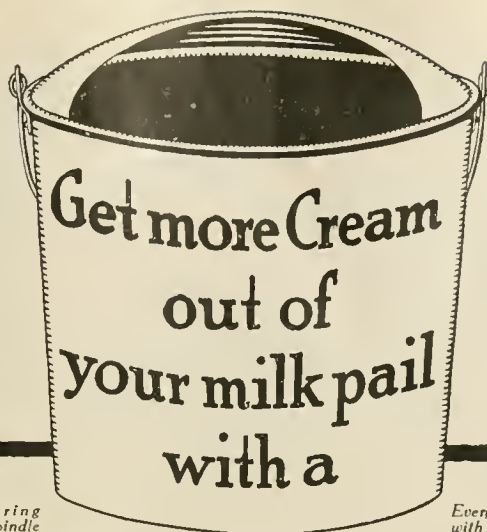
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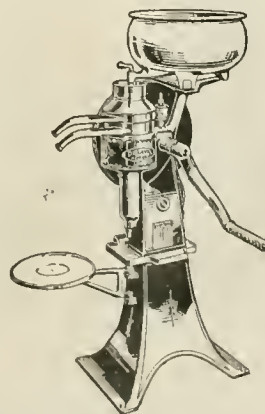
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Late Varieties: The Salway, Heath, Bilyeu and other varieties with a similar ripening period should receive the same treatment prescribed above, with

an additional application of self-boiled lime-sulphur mixture alone to be applied three or four weeks after the second application.

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Early Varieties: The Greensboro, Carman, Hiley, Mountain Rose, etc., and varieties of the same ripening period should receive the first and second applications only as prescribed for midseason varieties.

PLUM AND CHERRY SPRAYING

Japanese plums should receive the same treatment as peaches having the same ripening season. Soap should be added in the third application to enable the spray to stick to the smooth plum fruits.

Cherries should receive the same treatment as early varieties of peaches, except that commercial lime-sulphur

solution, diluted at the rate of one gallon to forty gallons of water, should be used in place of the self-boiled lime-sulphur. Where leaf-spot has been severe this solution should also be used in the fruit treatment. For the control of leaf-spot, an application of the diluted lime-sulphur should also be made as soon as the fruit is picked.

Plums other than the Japanese varieties should receive the treatment outlined in the peach schedule, except that commercial lime-sulphur solution diluted at the rate of one gallon to forty gallons of water is to be preferred to the self-boiled lime-sulphur.

SPRAY MATERIALS

Arsenate of Lead: This arsenical comes on the market in paste and powdered form. In orchard spraying the paste is used at the rate of two pounds and the powdered lead at the rate of one pound to fifty gallons of water or fungicide, as dilute lime-sulphur solution. When used in water without a fungicide, the milk of lime made from slaking two or three pounds of stone lime should always be added for each fifty gallons of spray to obviate danger of burning fruit and foliage. This poison may be obtained of various manufacturers or usually of local seedsmen,

implement dealers or druggists. Care should always be taken in the handling and storage of arsenicals to obviate the danger of poisoning persons or live stock. Where smaller quantities of the arsenicals are desired, the proportions indicated should be followed:

Lime-Sulphur Solution: Strong lime-sulphur solution is used as a dormant tree treatment for the control of scale insects and certain diseases, and in a much more dilute condition as a spray on trees in foliage for the control of various fungous diseases. Many growers prefer to purchase the commercial article, which comes on the market of a specific gravity of about 33 degrees Baume. This is used at the rate of one gallon to seven or eight gallons of water for winter spraying, and at the rate of one and one-half gallons of water for use on apple and other pome fruits as a summer fungicide. In summer spraying the arsenate of lead and 40 per cent nicotine sulphate is added to the dilute lime-sulphur solution, thus permitting the treatment of sucking and biting insects and fungous diseases. Concentrated lime-sulphur solution can be made at home, which practice is followed by numerous growers. Those interested in this matter should write to the Department for more explicit information than is feasible to give here.

Nicotine: Nicotine is used for the control of certain sucking insects as plant lice, the apple red bugs, the pear psylla, etc. This product comes on the market of various grades, but the grade known as 40 per cent nicotine-sulphate is mostly employed. This may be used alone in water to which has been added a little soap, or in lime-sulphur and arsenate of lead, or in bordeaux mixture and arsenate of lead sprays. It is employed at the rate of from three-quarters to one pint per hundred gallons of spray.

Bordeaux Mixture: Bordeaux mixture is composed of four pounds of bluestone (copper sulphate) and four pounds of stone lime to fifty gallons of water. For early summer spraying the amount of bluestone may be reduced to three pounds to lessen risk of injury. To make bordeaux mixture for use in an ordinary barrel sprayer, dissolve three or four pounds of bluestone in 25 gallons of water, and in a separate container slake four pounds of stone lime and dilute to 25 gallons, then pour the solutions simultaneously through a strainer into the spray tank. Stock solutions, especially where large quantities are to be used, are desirable, since they save time. A stock solution of bluestone is made by dissolving it at the rate of one pound to one gallon of water. The bluestone should be suspended in a sack in the upper part of the barrel or other con-

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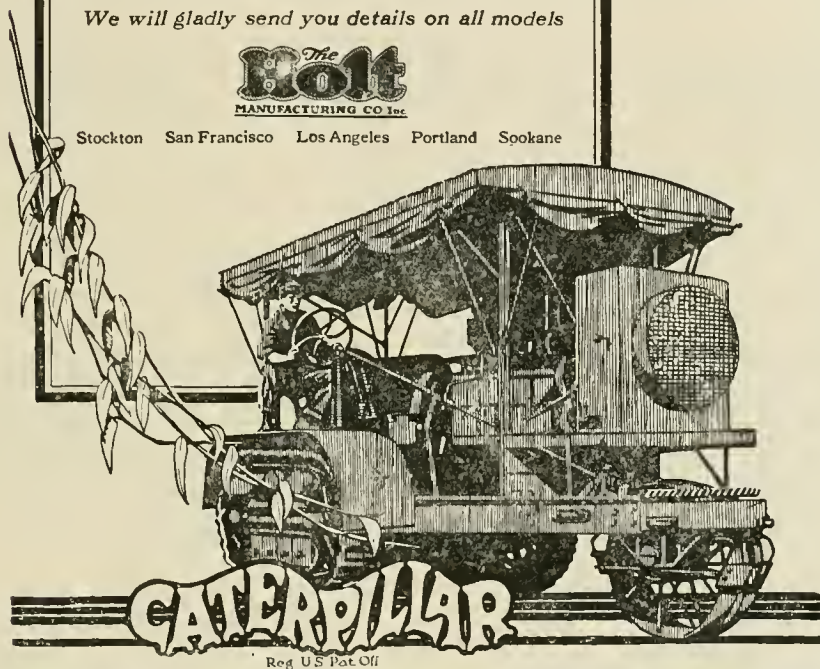
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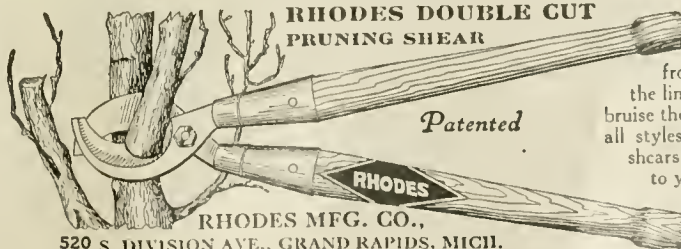


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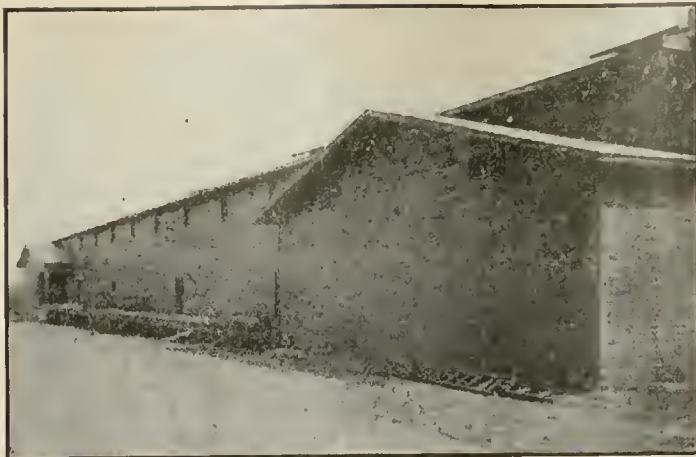
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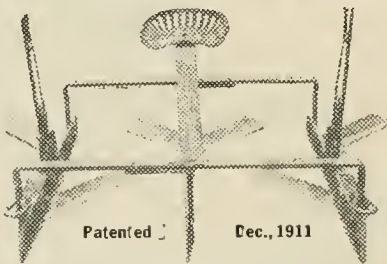
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CORNER FIRST AND OAK STREETS
PORTLAND, OREGON

tainer so that it is just beneath the surface of the water. It will be dissolved if left for a few hours in cold water and more rapidly in hot water. A stock solution of lime may be made by slaking the lime in a little water and then diluting so that each gallon of water contains one pound of lime. Just before the stock solutions are used they should be stirred thoroughly. To make up bordeaux mixture from stock solutions, it is only necessary for three or four gallons of the stock solution of bluestone to be poured into a suitable container and four gallons of the stock solution of lime into a separate container, diluting each to 25 gallons and then pouring them simultaneously into the spray tank. Commercial bordeaux may be used in place of the home-made product.

Self - Boiled Lime - Sulphur Mixture:
The self-boiled lime-sulphur mixture consists of eight pounds of sulphur and eight pounds of good stone lime to each fifty gallons of water and is made as follows: The lime is placed in a barrel and enough water added to nearly cover it. As soon as the lime begins to slake the sulphur should be added. Water should be added from time to time to form a thoroughly thick paste, which should be constantly stirred. As soon as the lime is entirely slaked, enough water should be added to cool the mixture, which is then ready to be strained into the spray tank, where it should be diluted to the proportions given above. The sulphur used may be in the form of "flowers," "flour" or "commercial ground," and should, if necessary, be run through a screen to break up lumps. Commercial substitutes for the self-boiled lime-sulphur may be used, but should not be confused with commercial lime-sulphur solution.

SPRAYING APPARATUS

For the proper application of sprays some form of spray pump with suitable nozzles is absolutely essential. Most spray outfits are supplied with spray rods permitting the operator to direct the spray as desired. The hose should be of sufficient length to permit convenient spraying.

Spray outfits vary in size from small bucket pumps to gasoline power outfits for large-scale operations. Bucket pumps answer well for small home orchards where but a few trees are to be sprayed. Where the orchard interest is larger, and especially where older trees are to be treated, a barrel pump is essential. A barrel pump may be purchased for twenty to twenty-five dollars, depending on the equipment. In spraying the outfit can be mounted upon a sled or placed in a cart or wagon. An outfit for operations on a still larger scale consists of a 100 or 200-gallon tank mounted upon a truck, having a strong, double-acting hand-pump mounted upon it. For large commercial operations, gasoline power outfits are largely used.

Further information on orchard spraying may be obtained by writing to U. S. Department of Agriculture or to your State Experiment Station.

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